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Arizona Corporation Commission
DOCKETED

NOV - 5 2004

DOCKETED BY

November 5, 2004

Jim Fisher, Executive Consultant
Utilities Division
Arizona Corporation Commission
1200 W. Washington St.
Phoenix, Arizona 85007

Re: Johnson Utilities Company - Application for an Extension of its Certificate of Convenience and Necessity (CC&N) Docket No. WS-02987A-04-0288

Dear Mr. Fisher:

Enclosed please find documents responsive to your letter of May 13, 2004. Johnson Utilities Company has also filed an amended legal description for the Merrill portion of the application concurrently with docket control. The enclosed draft CAAG §208 plan amendment, as well as the wastewater and water design reports for Merrill Ranch, encompass the areas contained in the amended legal description.

The documents included herewith to supplement the initial application are as follows:

Attachment 1- Draft CAAG §208 plan amendment.

Attachment 2- Master Wastewater Design Report – Merrill Ranch.

Attachment 3- Master Water Design Report – Merrill Ranch.

Attachment 4- Arizona Department of Water Resources ("ADEQ") Well Identification numbers, nitrate and arsenic concentration for all drinking water wells serving Johnson Utilities Company's water systems.

Attachment 5- Arizona Department of Environmental Quality Public Water System Identification numbers for all drinking water systems serving Johnson Utilities Company.

Attachment 6- ADEQ facility numbers for all wastewater treatment plants serving Johnson Utilities Company.

Notably, the enclosed CAAG §208 plan amendment is pending approval. However, there are no water and wastewater facilities that have been constructed within the two proposed certificate extension areas nor will services be provided until such approval is required.

Should you have any questions, please do not hesitate to call. Thank you for your time and efforts in this matter.

Very truly yours,

Jay L. Shapiro

Enclosures

cc: Brian Tompsett, Johnson Utilities Company
Docket Control (w/enc.)

1603847.1/51239.003

ATTACHMENT 1

CAAG 208 WATER QUALITY PLAN AMENDMENT FOR MERRILL RANCH FOR JOHNSON UTILITY SERVICE, LLC

November 2004

PREPARED FOR:

JOHNSON UTILITIES COMPANY, LLC
5230 East Shea Boulevard, Suite 200
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CAAG 208 WATER QUALITY PLAN AMENDMENT FOR

MERRILL RANCH

November 2004

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APPENDIX:

SECTION 1 – INTRODUCTION

This CAAG 208 Water Quality Plan Amendment will address the expansion of the Merrill Ranch area to the Johnson Utilities Company, LLC service area. The proposed project is located in Pinal County in an area of relatively flat topography. The sites are equally accessible to Phoenix and Tucson metropolitan regions and close to Florence, Apache Junction and Queen Creek. A portion of the Merrill Ranch Development includes the Mystic Lake Ranch area (shown on Exhibit 5a and 5b) as well as area east of Mystic Lake. A portion of the expansion area that is to be added to the Johnson Utility Service area is currently in the expansion of the City of Florence, Arizona 208 service area, however, the City of Florence has requested that Johnson Utilities provide sewer service to the first phase of Merrill Ranch since the city has no facilities in the vicinity of this site. The land within, and surrounding, this projects has historically been used for agricultural purposes. The main objective of this amendment is to propose the development of a wastewater treatment plant site that will serve numerous planned communities. It is anticipated that the project will use all of the reclaimed water produced from the wastewater treatment plant. Merrill Ranch (aka Rancho Sendero or Mystic Lake Ranch)site and its water reclamation facility (WRP) will be addressed in this amendment. Johnson Utilities Company, LLC's service area is located within the project areas and will be providing development, maintenance and operation of the wastewater facilities.

Development regulations serve as the primary mechanism for implementation of the land uses for the four projects. All construction and development within the PAD area shall comply with applicable provisions of the Pinal County Building Code. For the purpose of this PAD, the table in Exhibit 3 lists the types of land uses to be established. The project will contain varying residential densities, a golf course and club house, an elementary school, a high school. A fire station, a worship parcel, 2 recreation areas, and park site.

Merrill Ranch includes Rancho Sendero(Mystic Lake Ranch), a 1758 acre mixed use development, is located in central Pinal County along the east and west sides of Hunt Highway approximately five and one-half miles south of the Johnson Ranch development. Amendment # 4, Mystic Lake Ranch

area included 2643 acres, 1051 for Mystic Lake Ranch and 1592 acres for Farley Farms and other undeveloped land between Farley Farms and Mystic Lake Ranch. The Merrill Ranch area is 885 acres less than the Amendment #4 208 Amendment. Hunt Highway makes a 90 degree turn to the east at the southern boundary of the project. The southeast corner of the project is formed by the intersection of Attaway Road and Hunt Highway. The northern part of the project is bounded by the future alignment of Franklin Road, while Felix Road is one mile east of the eastern boundary. The site is surrounded by state, private and agricultural land.

The site will consist of low to medium density housing (Family-3.7 u/a and Active adult-4.2 u/a), a 15-acre elementary school site, a 40-acre high school site, a fire department site, a 16–acre worship site, an 18-hole golf course and clubhouse, 2 recreation sites(17 acres and 20 acres) and three 5-acre park sites. The development will also include an 2 recreation areas, three parks with an extensive trail system, and a riparian preservation area complete with hiking trails. The developer has enlisted the design services of a wildlife consultant to enhance the vegetation and wildlife within the riparian corridors.

Summary:

The proposed plant will be developed as an Aero-Mod Extended Aeration mechanical plant. The Extended Aeration plant is designed to provide seven potential phases of operation, however, the duration and number of phases is based on process considerations related to the effluent quality requirements of the specific wastewater treatment operation. Construction of the Water Reclamation Plant (WRP) and wastewater collection infrastructures will be phased in accordance with the growth and needs of the proposed development. Each future phase of the WRP will be constructed and operational before the capacity of the existing treatment facility is exceeded. The wastewater facilities will be designed to allow orderly expansion to occur as additional capacity is required. The wastewater effluent will be treated to reuse standards, for 100% reuse on open spaces, golf courses, recreational areas and landscaped areas.

The communities can be serviced within a short distance and the profile of the mechanical plant will be constructed to be aesthetically inconspicuous. The plant expansions will allow the facilities to

provide wastewater treatment to adjacent properties providing the parcel is within the utility's approved CC&N, and desires to be served. The main wastewater plant has anticipated growth in their immediate area, and will be sized accordingly.

Development of this project is anticipated to begin between the years 2005 through 2008. The project is composed of one or more of the following: family housing, adult communities, elementary school, high school, recreational areas, golf course and club house, fire station, recreation and park sites.

Johnson Utilities Company, LLC was formed as a utility company and is registered with the Arizona Corporation Commission (ACC) to provide water and sewer service to this area. Due to developer and consumer demand, Johnson Utilities Company, LLC will construct, operate and maintain the WWTP facilities. The franchise for utility service to this area has been granted by Pinal County. These proposed sites are within the currently approved franchise for the utility. Johnson Utilities Company, LLC has a Certificate of Convenience and Necessity (CC&N) from the ACC in order to provide water and wastewater service for the franchised areas, which will include Merrill Ranch. Approval of said application, and pending applications, will grant Johnson Utilities Company, LLC the proper rights and authorities to implement this plan. A copy of the CC&N. is on record with the ACC *(Appendix D)*.

SECTION 2 - MERRILL RANCH

DESCRIPTION OF PROJECT

Merrill Ranch will be developed to incorporate a range of low to medium density single family homes, an elementary school, a high school, an 18-hole golf course and clubhouse, a worship center, 2 recreation areas, 3 parks, trails several commercial areas and community parks connected by an extensive trail system. Riparian areas will be enhanced with hiking trails which will serve as a natural buffer between and within the proposed housing developments. The extensive trail system, recreational areas, and riparian preservation area will provide for approximately 18 percent of open space in the total land area.

It is anticipated that the project will be developed in four major phases (*Exhibit 5b*). The initial phase is a Planned Area Development (PAD) consisting of approximately 362.5 acres and has been approved for approximately 1,523 family units. The golf course, recreation areas, extensive trail system and riparian area will be developed in the latter part of this phase. Phase two consists of 425 acres with approximately 1703 housing units and the elementary school. Phase three consists of 407 acres with approximately 1381 housing units and a riparian area. The final phase of this project covers approximately 314 acres consisting of 1,161 housing units, a high school, a park site, and a trail system.

The WRP will be located in the southern western portion of the project. Treated effluent will be pumped by a reclaimed pump station to the golf course and riparian areas for 100% reuse on turf irrigation, open spaces, and landscaped areas. The initial plant will have a total capacity of approximately 1.0 MGD.

Summary:

The proposed plant will be developed as an Aero-Mod Extended Aeration mechanical plant. The Extended aeration plant is designed to provide several potential phases of operation, however, the duration and number of phases is based on process considerations related to the effluent quality requirements of a specific wastewater treatment operation. Construction of all the water reclamation plant (WRP) and wastewater collection infrastructures will be phased in accordance with the growth and needs of the individual projects. Each future phase of the WRP will be constructed and operational before the capacity of the existing treatment facility is exceeded. The wastewater facilities will be designed to allow orderly expansion to occur as additional capacity is required. The wastewater effluent will be treated to reuse standards, for 100% reuse on open spaces, golf courses, recreational areas and landscaped areas

The communities can be serviced within a short distance and the profile of the mechanical plant will be constructed to be aesthetically inconspicuous. The plant expansions will allow the facilities to provide wastewater treatment to adjacent properties providing the parcel is within the utility's approved CC&N, and desires to be served. The main wastewater plant have anticipated growth in their immediate area, and will be sized accordingly. Areas included in this amendment are only areas currently approved by, or those who have applied for service to, the Arizona Corporation Commission (ACC).

Development of these projects is anticipated to begin between the years 2005 through 2006. All of the projects are composed of one or more of the following: family housing, adult communities, elementary schools, recreational areas, equestrian centers, and some commercial areas.

Johnson Utilities Company, LLC was formed as a utility company and is registered with the Arizona Corporation Commission (ACC) to provide water and sewer service to this area. Due to developer and consumer demand, Johnson Utilities Company will construct, operate and maintain

the WWTP facilities. The franchise for utility service to this area has been granted by Pinal County. These proposed sites are within the currently approved franchise for the utility. Johnson Utilities Company, LLC has a Certificate of Convenience and Necessity (CC&N) from the ACC in order to provide water and wastewater service for the franchised areas, which will include Merrill Ranch and adjacent sites. Approval of said application, and pending applications, will grant Johnson Utilities Company, LLC the proper rights and authorities to implement this plan. A copy of the CC&N. is on record with the ACC *(Appendix D)*.

WATER RECLAMATION PLANT PHASING

In preparing the phasing plans, certain assumptions have been made. These include: 1) the rate of growth for the project remains constant as calculated; 2) the rate of growth of other regional projects used in assessing cumulative impacts on phased infrastructure and services remains constant as calculated; and 3) the market demand for proposed residential product type and mix remains constant throughout the phasing intervals. If the build-out rate internal to projects accelerates or decreases, key infrastructural components may be re-phased.

Merrill Ranch WRP will generally be developed in four phases. A summary of the proposed phasing sequence by planning area is provided below.

PHASE	YEAR	INFRASTRUCTURE CAPACITY
A	2005-2009	Start of Project - Start-up of Aero Mod Mechanical Treatment Plant and Effluent Re-use at the adjacent Golf Course, and wildlife area (1.4 MGD).
B	2009-2014	Addition of a 1.4 MGD Mechanical Treatment Effluent Reuse/Excess Discharge
C	2014-2019	Addition of a 1.4 MGD Mechanical Treatment Effluent Reuse/Excess Discharge
D	2019-2025	Estimated build out of the final 1.4 MGD is anticipated to be completed within the remaining 5 years for 7997 units. There will be no additional hook-ups after the 7997 units. Total build out will be 5.6 MGD, and is dependent on economic development trends over the next 20 years.

Johnson Utilities Company, LLC will collect all wastewater with the completed facilities within the designated communities and deliver it to the proposed wastewater treatment plant site.

The proposed site is located west of Hunt Highway, within the North Half (N ½) of Section 25, Township 4 South, Range 8 East, G&SRM, Pinal County, Arizona. Based on builder projections, the utility has anticipated that this site will be constructed and operating at full capacity within the next 15 years. The Rancho Sendero property (Sections 24 and 25, T4S, R8E) is currently owned by Fox Hunt Properties, an affiliate of Johnson Utilities Co., L.L.C. The remainder of the property within Merrill Ranch is owned by Pulte Homes and Del Webb. Johnson Utilities will purchase and construct the WRP at a total build-out capacity of approximately 5.6 MGD. The facility will also

provide service to undeveloped land south of Merrill Ranch. and other adjacent subdivisions if requested within the Johnson Utilities CC&N areas.

Approximately two-thirds of the property will be impacted by the localized drainage from the buttes located on the north and west of the site. Flows running from east to west coalesce with a major wash located along the eastern portion of the site. The wash conveys water from north to south and drains a portion of the Gila River watershed. The proposed site is not within a 100 year flood zone. Detention of offsite stormwater runoff will be achieved by utilizing golf course basins and turf retention.

The treated effluent will be used for irrigation of the golf course to be constructed at the project. The golf course will be located on the east side of Hunt Highway and is spread throughout Sections 24 of Township 4 South , Range 8 East and Sections 18, and 19 of Township 4 South, Range 9 East.. The project is located entirely within the Pinal A.M.A. The golf course parcel within Section 24, Township 4 South, Range 8 East is owned by Fox Hunt Properties, and the golf course property with Sections 18, and 19, Township 4 South, Range 9 East are owned and will be operated by Pulte Homes and Del Web. Initial irrigation of the golf course at Merrill Ranch will be provided by using existing irrigation wells. When the proposed wastewater treatment facility produces enough reclaimed water, the golf course will be irrigated entirely with the reclaimed water.

This water reclamation plant proposed for Merrill Ranch will bring several benefits to the area:

- Merrill Ranch will feature a range of low to medium-high density neighborhood housing, recreation, (equestrian trails, and a wetlands area), and employment opportunities for the residents of Pinal county. The development will increase the tax base without creating infrastructure costs for the County.
- Merrill Ranch will provide a master planned development with a variety of residential opportunities and some limited local commercial uses. The project will allow the County to continue to grow in a manner compatible with the County's Comprehensive Plan.
- Merrill Ranch is located immediately adjacent to Hunt Highway, a major transportation

corridor, which will allow for the efficient use of the existing transportation infrastructure.

The population projection estimates for permanent and seasonal residents within Census Tract Eight of Pinal county will increase from 7,600to 9,894 from 1995 to 2015 (Pinal County Comprehensive Plan, Area 3, 1998). By the year 2015, 2,832 projected new housing units are required to meet future housing needs within the Census Tract Eight area of Pinal County. These numbers were estimated using historic rural patterns of growth within Pinal County.

Summary:

The proposed plant will provide the following benefits for its respective sites:

- The effluent from the wastewater treatment plant will be required to meet effluent reuse standards for open-access golf courses and other open area facilities located adjacent to the WRP, and to meet reclaimed water requirements, which is equivalent to secondary treatment and disinfection. Due to the quality of the treated effluent, the areas of re-use will provide recreational opportunities to residents. In addition, effluent discharged to the waters of the U.S. through a NPDES Permit will be required if all effluent is not used on the golf courses and open space areas. A NPDES permit will be required for this project.
- A higher level of wastewater treatment will be provided, thus eliminating the potential for groundwater contamination from overuse of septic tanks and leach fields in the area.
- The existence of the wastewater treatment plants will allow the areas to accommodate growth without creating detrimental environmental situations due to a lack of infrastructure.
- The project is close to Florence and East Mesa and provide a reasonable commute that will provide housing opportunities to satisfy current housing shortages.
- Affordable housing for prison employees in Florence.
- The employment opportunities in the southeast valley area are increasing with the development of Williams Gateway Airport and other significant employers. The development will provide housing opportunities for the increased workforce needed.
- The residents of the development will add to the consumer tax base in the existing Pinal County area. The increase in the number of consumers will support growth of commercial

development in Pinal County as well as increased sales tax revenues.

Landscaped open area parks and corridors throughout the development, irrigated with properly treated effluent, will encourage and enhance outdoor recreational activities , which may include golf courses, public parks and lakes, wetlands, and hiking and extensive trail system for the residents within the respective areas.

WASTEWATER FLOW PROJECTIONS

The following is an estimate of the wastewater flows projected for each plant site and the subdivisions it will provide service to. A more detailed flow breakdown by subdivision can be found in Appendix E, Sewer Flow Projections. If the Flow Projection chart is not available for the specific subdivision, it means the subdivision is still in the development stage and no current PAD has been completed at this writing.

Phase A of the sewage flows to this site consists of an initial 1,523 residential units, Phase B consists of 1,703 residential units, Phase C adds another 1,381 residential units, and Phase D incorporates the final 1,161 residential units.

Summary:

In order to estimate the projected sewer flows for these areas of the Johnson Utilities service area, the criteria as outlined below was utilized. Flow estimates for family and adult retirement residential, commercial and school facilities were derived based upon historic flows near this area. The flows are based on the population and acreage per phase of each project. These flow projections have recently been accepted by ADEQ for this area of the valley (*See Appendix E).* The design criteria for the Johnson Utilities Company is as follows:

SEWER PLANNING CRITERIA

- 90 Gallons Per Capita per Day (GPCD) for all residential areas requiring sewers
- 1.8 persons/Dwelling Units (DU) for all Adult Community Residences
- 2.6 persons/DU for all Family Community Residences
- 1,000 Gallons Per Area Development (GPAD) for all commercial and school areas [Average Daily Flow (ADF)]
- 3.0 Peaking Factor for all commercial and school areas [Peak Dry Weather Factor (PDWF)]
- 250 GPAD for wet weather flow infiltration

WASTEWATER SYSTEM INFRASTRUCTURE REQUIREMENTS

Merrill Ranch will be primarily served by gravity sewer mains. The gravity sewer main sizes have been determined and designed *(See Exhibit 6)*. The proposed lift station pumps will convey the collected wastewater to the wastewater treatment plant site located in the north half of Section 25, Township 4 South, Range 8 East G&SRM.

The wastewater will be treated to Class A reclaimed water standards. The treated effluent will be pumped by a reclaimed pump station to the golf course for turf irrigation and the habitat areas for plantings. Detention of offsite stormwater runoff will be achieved by utilizing golf course basins and turf retention. Basins will be used to intercept onsite stormwater runoff.

Summary:

The water reclamation facility will be primarily served by gravity sewer mains where possible and a force main where needed. The sewer lift stations will lift all flows from the gravity sewer collection system into the headworks of the treatment plant facility. The influent sewer lift stations will be

constructed and upgraded to match the capacity increments of the future wastewater treatment plants as required. The sewer lift stations will be designed using duplex pumps, backup power, and all required facilities to meet ADEQ Bulletin 11 design standards. The actual timing and sizing of the wastewater collection systems will depend on phased construction of the projects. The wastewater generation estimates for family and adult residential and commercial uses were derived based on historic flows near these areas.

Historically, the land in these areas has been used for farming or cattle operations and there have been water quality problems in the past. Houses in this area have treated wastewater by using individual septic tanks. To prevent future nitrate problems, Johnson Utilities will not approve septic tanks, except for existing or previously approved septic tank systems for developments within the Johnson Utilities service area. By providing a high level of wastewater treatment and quality control methods, Johnson Utilities will work improve the quality of the groundwater in this area.

The treatment plant facility will be sized to treat the average daily flow (ADF) and accept peak wet weather flows (PWWF) without disrupting the treatment plant process. The wastewater will be treated to "open access" reuse standards. The treated effluent will be pumped by a reclaimed pump station to the planned reuse areas for the four project sites for golf courses, parks, greenbelts and other turf irrigation. The utilities will be requesting reuse permits approved by ADEQ for the water reclamation facility site to irrigate at a average rate of 5.6 MGD, based on the development project area.

SECTION 3 - WATER RECLAMATION PLANT DESCRIPTION

Exhibit 7, Water Reclamation Plant Site Layout, shows the general layout. The plant will be constructed and phased per service needs as the project develops. Phase A of all the facilities will typically consist of an influent pump station, inlet headworks, and a Aero-Mod Extended Aeration mechanical Water Reclamation Plant having an initial capacity of 1.4 MGD. During the initial phase, the volume of effluent generated will be less than the reuse area requirements. This will be supplemented with groundwater until the volume of effluent meets the golf course requirement and/or turf irrigation needs. Phase B of the mechanical treatment facilities will consist of project phasing as discussed in the Water Reclamation Plant Phasing section.

Johnson Utilities has initiated and anticipated financial requirements for the construction of the mechanical plants in anticipation of developers needs for these areas. The utility has committed to installing the mechanical plants at the proposed sites as soon as permitted. Johnson Utilities will construct the plants. All of the plants are anticipated to be operational by 2005 at the latest.

The developer is integrating the recreational areas, such as golf courses, wetlands, parks and recreational lakes, for all sites into the layout for homes, therefore the areas will not be fenced and the reuse effluent will meet open access requirements. If excess flows are experienced during portions of the winter months, effluent will be stored within the golf course lakes, wetlands, man-made lakes, or used on landscape areas within the community. Effluent discharges into the waters of the United States is not anticipated.

SECTION 4 - PERMITTING REQUIREMENTS

The following is a summary of the permitting requirements and processes that are required for the wastewater treatment plant facilities. Each project will require an Individual Aquifer Protection Permits (APP).

A. Aquifer Protection Permit (APP)

The State Aquifer Protection Permit (APP) Program was established by the Environmental Quality Act (EQA) and is primarily designed to regulate facilities that may discharge to the aquifer. Proof of Best Available Demonstration Control Technology (BADCT) is required. Achievement of BADCT for a wastewater treatment plant facility is outlined in the AAC Title 18. Chapter 9, Article 2, Part B. APP permits will be applied for starting in 2005. This plant will generate the maximum effluent re-use flow permitted by each permit.

B. Reclaimed Water Permit

Each end user will need to obtain a Reclaimed Water Permit from the Arizona Department of Environmental Quality. A copy of any Reclaimed Water Permits will be included in the Appendix A. Modifications to these permits will be made as required. If all of the reclaimed water is not able to be used on landscaping and golf course areas, impoundments (recharge basins) will be necessary for discharging any excess reclaimed water. The reclaimed water will receive ultraviolet disinfection prior to discharging into basins.

C. Section 208 Plan Amendment

In accordance with Section 208 of the Clean Water Act, an Area Wide Water Quality Management Plan was prepared for the Central Arizona Association of Governments (CAAG). The Water Quality Management Plan has continually been updated through several Plan Amendments and updates. This document will serve as the 208 Water Quality

Plan Amendment for Merrill Ranch. The facility will be serviced and managed by Johnson Utilities Company, L.L.C. The Central Arizona Association of Governments (CAAG) is a Designated Area-wide Water Quality Management Planning Agency for Pinal and Gila Counties.

D. National Pollution Discharge Elimination System Permit (NPDES)

A NPDES permit is required for wastewater effluent planned to be discharged to surface waters of the United States. A NPDES Permit for effluent discharges to the waters of the United States is not anticipated to be required for these projects.

A pre-treatment program will be established in conformance with the Clean Water Act (CWA) for non-domestic wastes. The pre-treatment program will consist of chlorination and de-chlorination of effluent prior to discharge which will determine which non-domestic users should be regulated.

The NPDES program also regulates sewage sludge under Section 405 of the Clean Water Act (CWA). Part 503 in the Clean Water Act (CWA) controls the quality of sewage sludge that may be applied to land, distributed and marketed, placed in a sludge disposal facility, or fired in a sewage sludge incinerator. The sludge generated at the proposed wastewater treatment plant will be disposed of at an operating landfill certified by the state to handle and dispose of sludge from wastewater treatment plants. Protection of the groundwater at the landfill location will be provided by the landfill facilities. The closest landfill which can accept sludge for disposal is:

Butterfield Station Municipal Solid Waste Landfill
99th Avenue, one mile north of Highway 238
Mobile, Arizona

Operated by:

Waste Management, Inc.
2425 South 40th Street
Phoenix, Arizona 85034
Phone: (602) 256-0630

In discussions with Waste Management, Inc., they anticipate having sufficient disposal capacity to handle the disposal needs of the region for the next 50 years. A NPDES Permit for sludge disposal will not be required by the utility.

A NPDES Stormwater Pollution Prevention Permit will be required for the treatment plant site work. The contractor for the facilities is responsible to obey all NPDES Permit regulations as they apply to construction sites and potential surface water and groundwater contamination. All hazardous materials and potential pollutants shall be stored onsite in appropriate storage areas which are constructed to contain any spills or runoff of hazardous materials. Appropriate sites are to be provided for the washing of construction equipment and capture of the runoff. Retention basins, silt traps, and other sediment barriers are to be provided at the site to filter sediment from storm runoff leaving the site. The contractor shall keep the site clean and have covered dumpsters onsite which are emptied on a regular basis.

E. Wastewater System Technical Review

The technical review process consists of submitting a design report and detailed construction plans for the plant site, treatment plant design, required plant details and associated facilities. The plans will be prepared to be in conformance with AAC Title 18, Chapter 9, Article 2, Part B, as issued by the Arizona Department of Environmental Quality.

F. Local Floodplain and Drainage Regulations

The Merrill Ranch site, when entirely built out, is designed to discharge runoff at a rate equal to or less than the current runoff rate as undeveloped property. The drainage concept for the Merrill Ranch requires that all runoff be directed toward retention/detention basins within the golf course or designated sites. Runoff will be stored in the basins, allowing sediment to settle out, and then be released into the natural drainage courses in a controlled manner. This type of retention/detention drainage concept will be utilized within the four proposed WWTP sites. The retention basins will be landscaped in such a way as to provide bio-filtration of the first-flush storm runoff. In order to eliminate non-point discharges from the golf courses, the golf courses have been designed to retain runoff within swales built into the fairways.

SECTION 5 - PROJECT FINANCING

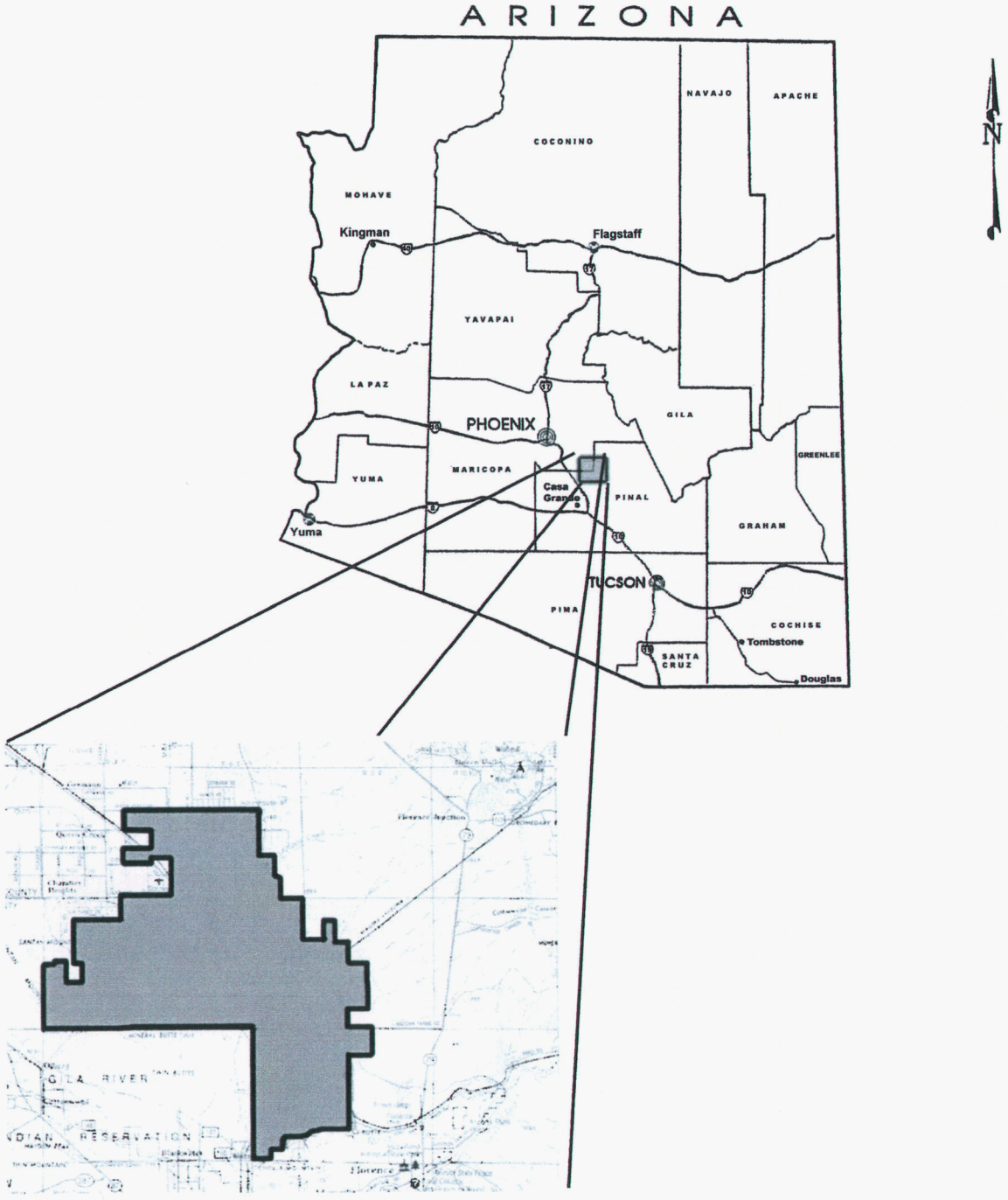
The cost for wastewater treatment plant facilities will be provided in part through line extension agreements between the developers and Johnson Utilities, and connection fees. The Company was formed as an Arizona limited liability company and has been approved by the Arizona Corporation Commission (ACC) to provide Certificates of Convenience and Necessity (CC&N) for water and wastewater service to this development. As a public service corporation, the Company is required to obtain prior approval of all long-term financing pursuant to A.R.S. 40-301 et.seq.

The long-term debt and the managing membership funds will be provided by the Utility, who is serving this project. The associate membership funds will be provided by substantial homebuilders who acquire given subdivisions within the development and who will also pay the costs associated with the utility facilities for that subdivision as part of the acquisition cost. Developer payments will cover all costs for onsite facilities, plus a portion of the common facilities needed to serve that subdivision. These expenses will be funded through the Corporation Commission's tariff, docket # U-2987, approved by decision #60223, on May 30, 1997. This public document is on file with the Corporation Commission.

Cost estimates for the WRP development are provided on Exhibit 9. The estimate is based on a 1.4 Million gallon per day (MGD) Aero-Mod Extended Aeration plant. The proposed plant will be constructed in four phases, each phase will be 1.4 MGD. Construction of additional phases will be required based on the development schedule within the PAD and service area.

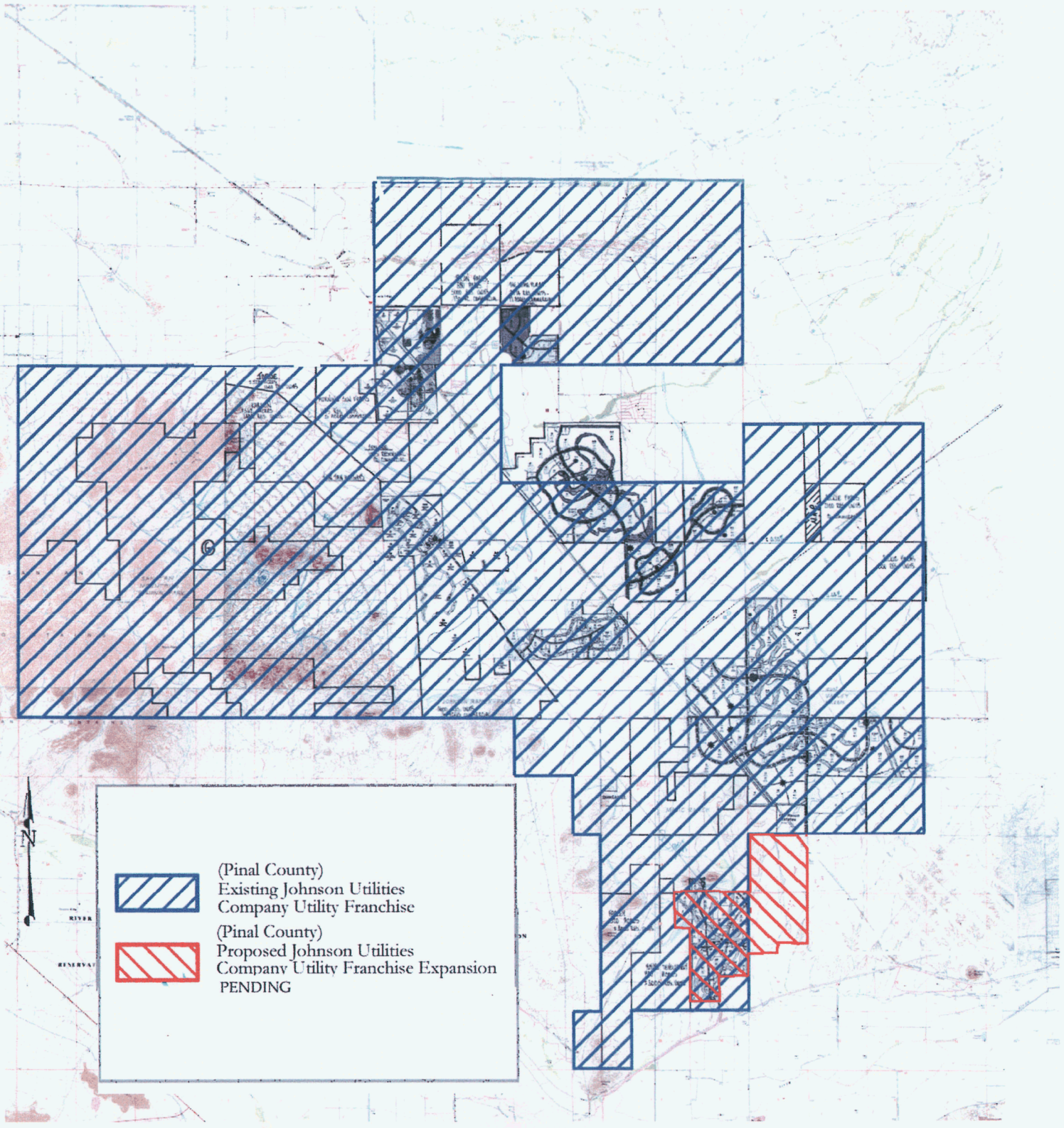
As a condition of the Certificate of Convenience and Necessity, the Commission has established the rates at which the Company can charge customers for provisions of the utility services. Those rates include all pro forma costs associated with the operation and maintenance of the wastewater facilities. As operating costs change over the years, the Company will apply to the Commission for adjustments in those rates to cover all operation and maintenance expenses as well as a return on the investment the Company has made in the utility facilities.

LIST OF EXHIBITS



LOCATION MAP

Exhibit 1

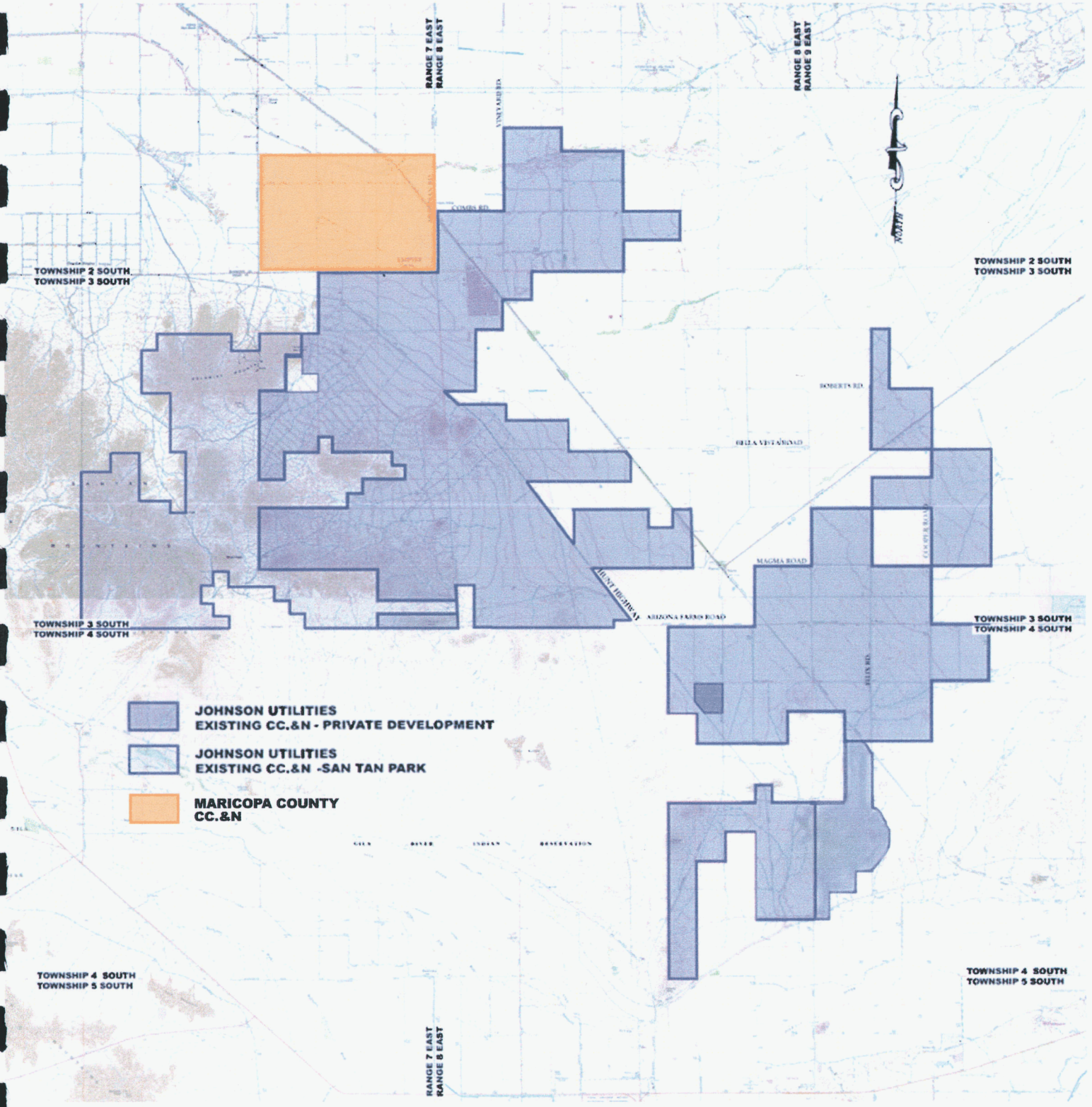


JOHNSON UTILITIES PROPOSED FRANCHISE AREAS

MERRILL RANCH

208 Plan Amendment #8

Exhibit 2



JOHNSON UTILITIES
CC&N AREAS
PINAL COUNTY

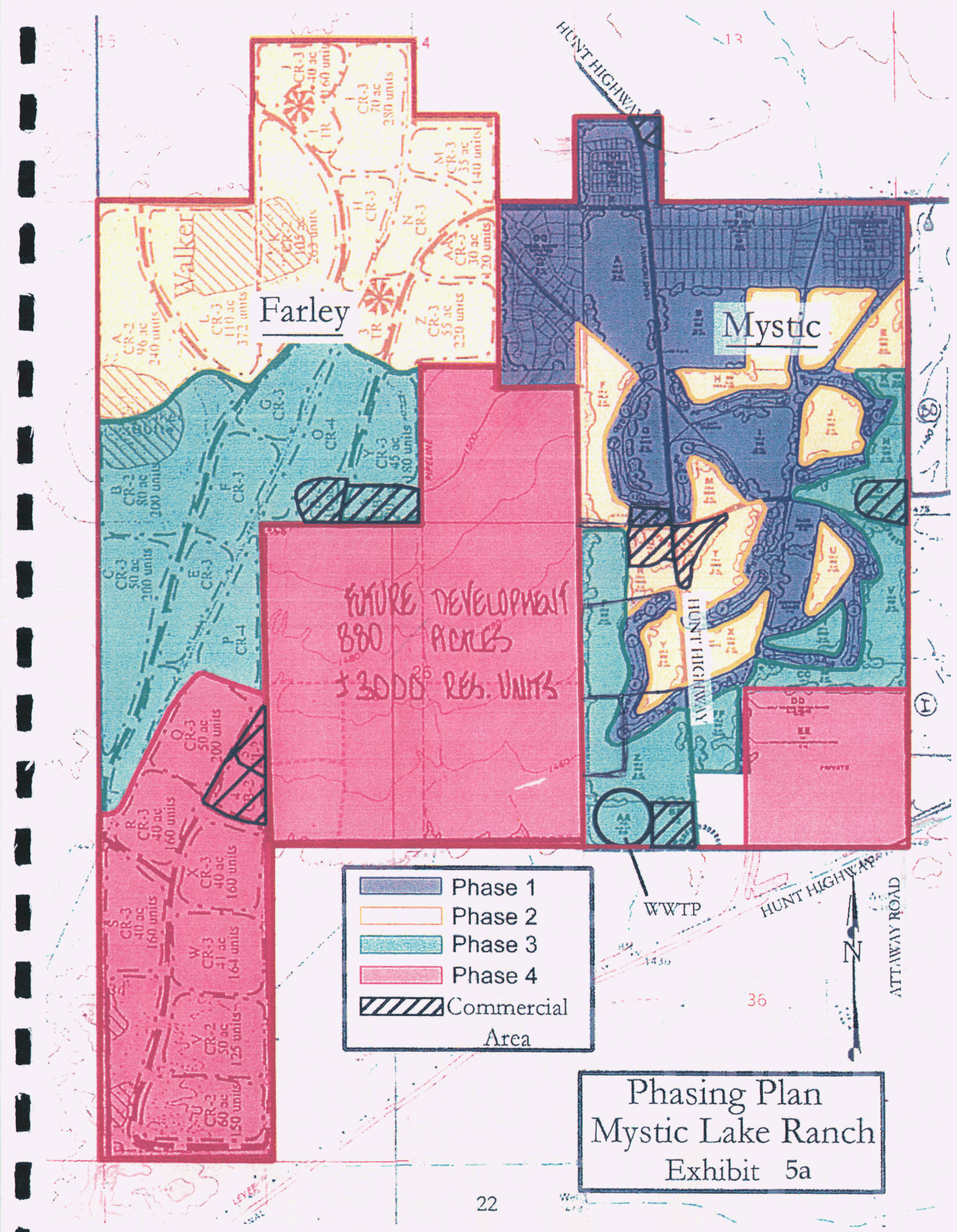
Exhibit 3

LAND USE TABLE

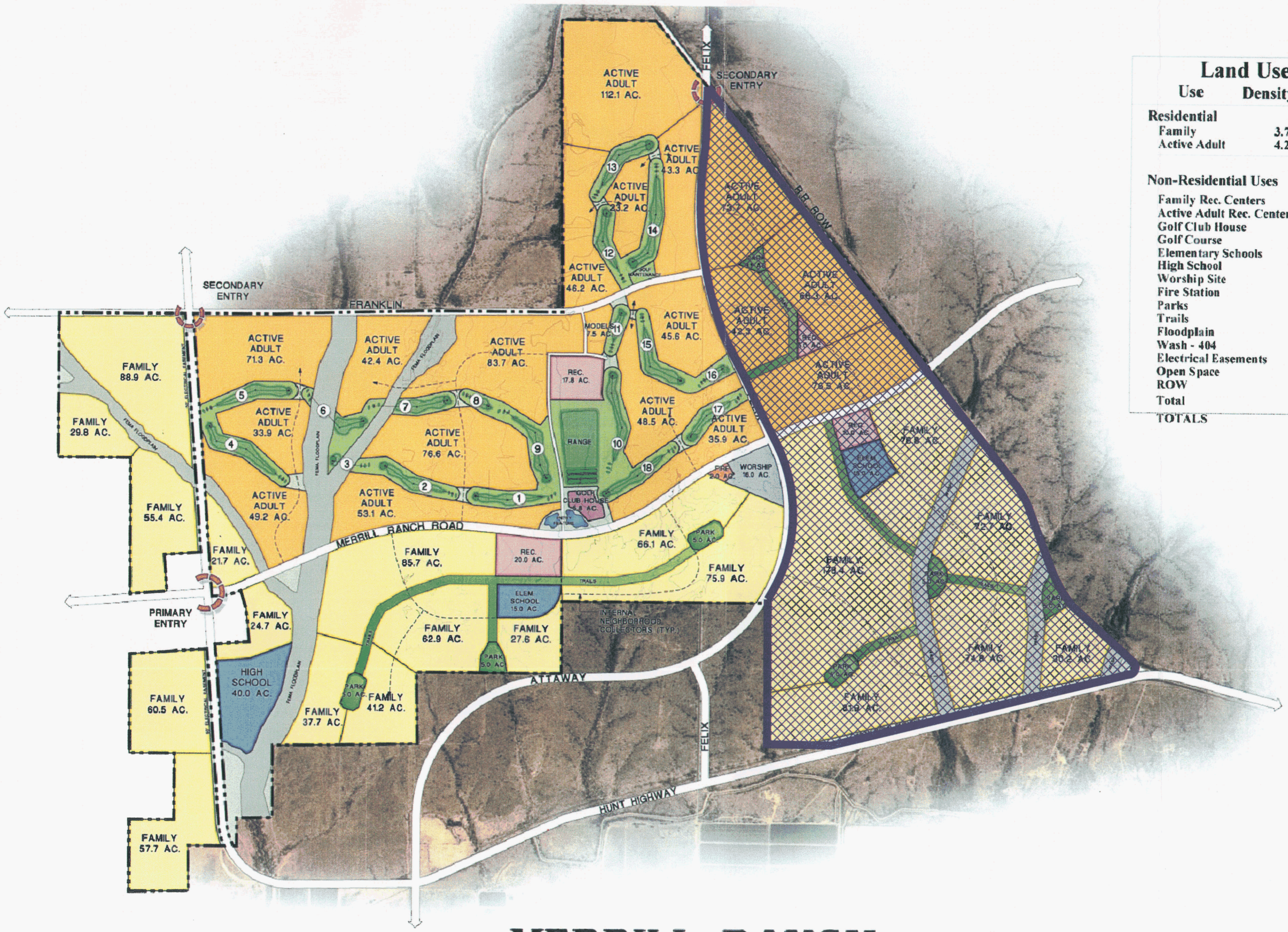
Land Use	Land Use Designation	Proposed Zoning	Res. Per Acre (RAC)	Target Units
Residential	Low Density Residential	R-1	3.7	2721.0
Residential	Medium Density	R-2	4.2	3047.0
Fire Station	Fire Station	CR-3	4.1 - 7.0	5.6
Church	Worship sites	C-2		16.0
School	Elementary School	C-2		15.0
School	High School	C-2		40.0
Commercial	Commercial	C-2		6.8
Parks	Park sites	OS		15.0
Recreation	Recreation Area			37.8
Golf	Golf	OS		234.6
Riparian Area	404 and wash	OS		91.0

LAND USE TABLE

EXHIBIT 4



Phasing Plan
Mystic Lake Ranch
Exhibit 5a



Land Use Schedule

Use	Density	Acreage	Units
Residential			
Family	3.7	1253.6 Ac.	4,636
Active Adult	4.2	1,031.3 Ac.	4,331
		2284.9	8,967
Non-Residential Uses			
Family Rec. Centers		30.0 Ac.	
Active Adult Rec. Centers		22.8 Ac.	
Golf Club House		5.8 Ac.	
Golf Course		234.6 Ac.	
Elementary Schools		30.0 Ac.	
High School		40.0 Ac.	
Worship Site		16.0 Ac.	
Fire Station		2.0 Ac.	
Parks		33.1 Ac.	
Trails		57.4 Ac.	
Floodplain		159.4 Ac.	
Wash - 404		59.2 Ac.	
Electrical Easements		20.2 Ac.	
Open Space		36.9 Ac.	
ROW		106.6 Ac.	
Total		854.0 Ac.	
TOTALS		3,138.9 Ac.	8,967

PULTE / DEL WEBB

MERRILL RANCH

Florence, Arizona

CONCEPTUAL MASTER PLAN E2

Exhibit .5b

SCALE : 1" = 800'

0 800 1600 2400 NORTH 06-17-04

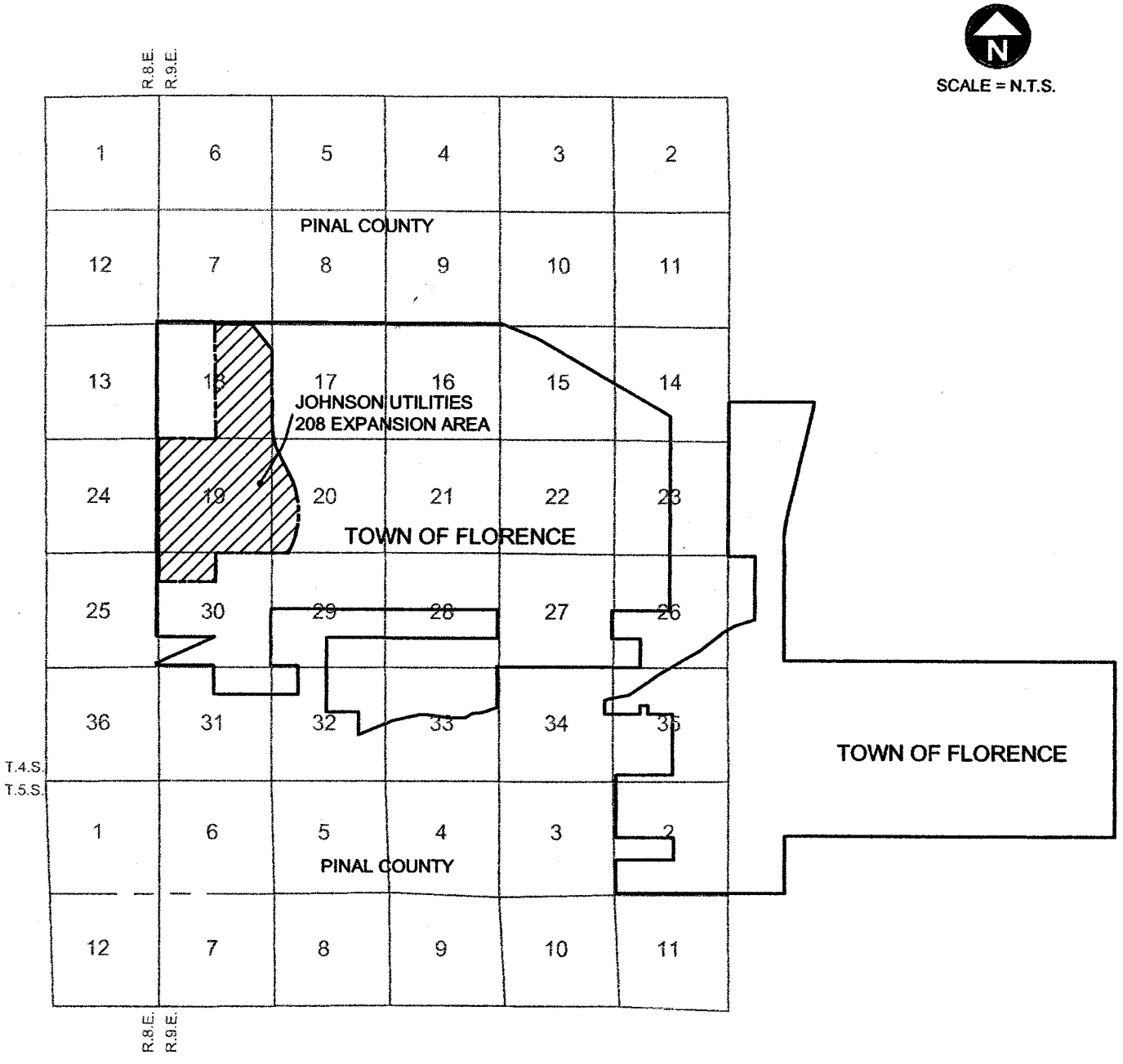
Base mapping compiled from best available information. All map data should be considered as preliminary, in need of verification, and subject to change

File: L:\242814\Conceptual MP\RVI-Con E2.dwg

The developer has reserved the right, without notice, to make changes to this map and other aspects of the development to comply with governmental requirements and to fulfill its marketing objective.

AUGUST 31, 2004

PULTE-MERRILL RANCH
TOWN OF FLORENCE



JACK JOHNSON COMPANY
Designing World Destinations
In-Person - 1777 Sun Peak Drive - Park City - Utah 84098
Telephone - 435 645 9000 – Facsimile - 435 649 1670
www.jackjohnson.com

PATH: Y:\742\Merrill\Ranch\DM_Design\Survey\Johnson 208 Area\742 PULTE-MR - 208 Exhibit.dwg

EXHIBIT 5c

JACK JOHNSON COMPANY
Designing World Destinations

PULTE-MERRILL RANCH
Legal Description
Johnson Utilities-Expanded 208 Area

August 30, 2004

A portion of land lying within Section 19, and portions of Sections 18, 20 and 30, Township 4 South, Range 9 East of the GILA and SALT RIVER MERIDIAN, County of Pinal, Arizona, more particularly described as follows:

Beginning at the found U.S. G.L.O. 2½" Brass Cap at the North Quarter Corner of said Section 18;

Thence South 89°56'54" East along the Northerly Section Line of said Section 18, a distance of 1705.71 Feet to a point on the Southeasterly Railroad right of way line.

Thence South 39°07'29" East along said right of way line a distance of 1480.55 to the Centerline intersection of Felix Road.

Thence along said Felix Road centerline the following (4) courses.

1. South 00°34'05" East 3478.49 Feet to the beginning of a tangent curve, concave to the left and having a radius of 3000.00 Feet.
2. Thence Southeasterly along the arc of said curve through a central angel of 27°13'48" 1425.76 Feet to a point of tangency.
3. Thence South 27°47'53" East 969.69 Feet to the beginning of a tangent curve concave to right and having a radius of 4000.00 Feet.
4. Thence Southerly along the arc of said curve through a central angle of 55°24'15" a distance of 3867.95 Feet to a point of non tangency also being the point of intersection of the centerline of Felix Road and the Northerly Line of said Section 29.

5745 N. Scottsdale Road, Suite 130 · Scottsdale · AZ 85250 | Telephone · 480.214.0370 ·· Facsimile · 480.214.0356

SCOTTSDALE ·· PARK CITY ·· BOISE

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EXHIBIT 5C

Thence South 89°54'02" West, along the Northerly Line of said Section 29, a distance of 775.03 Feet to a found 3" Pinal County Highway Department Aluminum Cap at the SOUTHEAST Section Corner of said Section 19;

Thence North 89°55'22" West along the Southerly Section Line of said Section 19, a distance of 2622.99 Feet to a found US GLO 2 ½" Brass Cap at the Quarter Corner point common to said Sections 30 and 19.

Thence South 00°03'30" West along the North-South Mid Section Line a distance of 1321.64 Feet

Thence North 89°55'37" West a distance of 2636.01 Feet to along the South Line of the North half of the Northwest Quarter of said Section 30.

Thence North 00°26'55" West along the West Section Line of said Section 30 a distance of 1322.38 Feet to a found US GLO 2 ½" Brass Cap at the Northwest Section Corner of said Section 30.

Thence North 00°26'07" West along the Westerly Section Line of said Section 19 a distance of 2646.78 Feet to a found 3" Aluminum Cap at the West Quarter Corner of said Section 19.

Thence continuing North 00°26'00" West along the Westerly Section Line of said Section 19 a distance of 2639.63 Feet to a found US GLO 2 ½" Brass Cap, This monument being disturbed and bent to the North, its position determined at the base of the monument, at the Northwest Section Corner of said Section 19.

Thence South 89°55'13" East along the Northerly Section Line of said Section 19 a distance of 2666.33 Feet to a found US GLO 2 ½" Brass Cap at the Quarter Corner common to said Sections 18 and 19.

Thence North 00°38'49" West along the North-South MID-Section Line of said Section 18 a distance of 2642.84 Feet to a Found 1 ½" Aluminum Cap being the center Quarter Corner of said Section 18.

Thence North 00°38'34" West a distance of 2643.23 Feet to a found US GLO 2 1/2" Brass Cap at the North Quarter Corner of said Section 18, and the Point of Beginning for the herein described tract.

Said description contains 1,134.78 acres, more of less.

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EXHIBIT 5C

Land Use Schedule

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Worship Site		16.0 Ac.	
Fire Station		2.0 Ac.	
Parks		33.1 Ac.	
Trails		57.4 Ac.	
Floodplain		159.4 Ac.	
Wash - 404		59.2 Ac.	
Electrical Easements		20.2 Ac.	
Open Space		36.9 Ac.	
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TOTALS		3,138.9 Ac.	8,967

PULTE / DEL WEBB

MERRILL RANCH

Florence, Arizona

CONCEPTUAL MASTER PLAN E2

Exhibit 6

SCALE : 1" = 800'

0 800 1600 2400

NORTH

06-17-04

Base mapping compiled from best available information. All map data should be considered as preliminary, in need of verification, and subject to change.

File: L:\242814\Conceptual MP\RVI-Con E2.dwg

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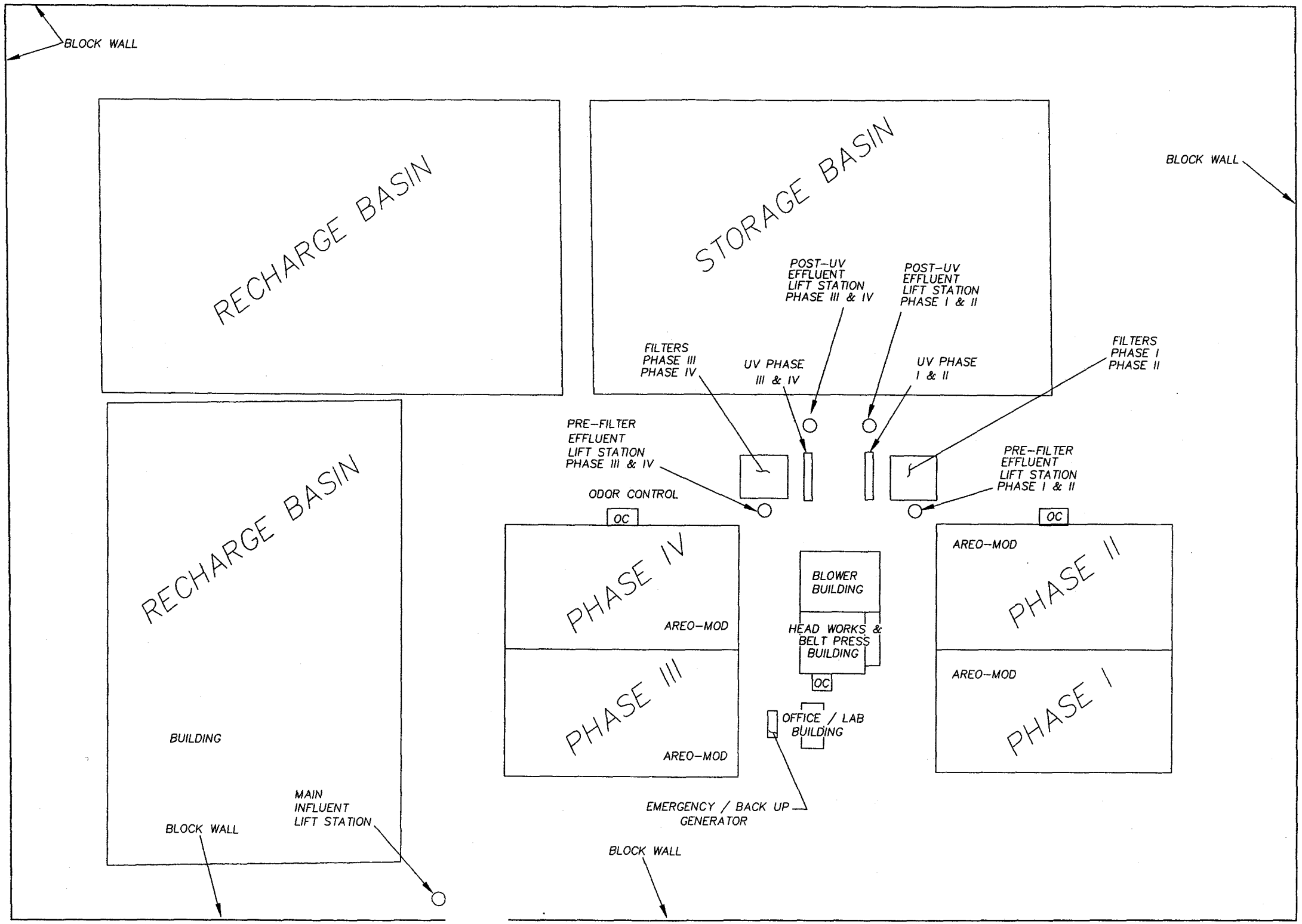

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SPECIFIC ENGINEERING, LLC.
5230 E. SHEA BOULEVARD SUITE 220
SCOTTSDALE, ARIZONA 85254
Phone: (480) 596-6335
FAX: (480) 596-6437

REVISIONS			
NO.	DATE	APP.	DESCRIPTION

CLIENT/PROJECT

WATER RECLAMATION PLANT

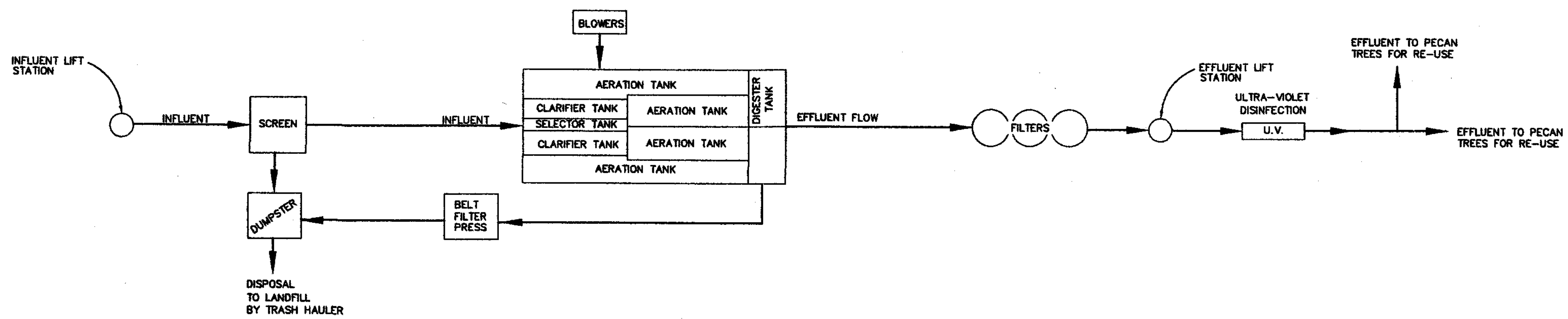
SEAL

TITLE

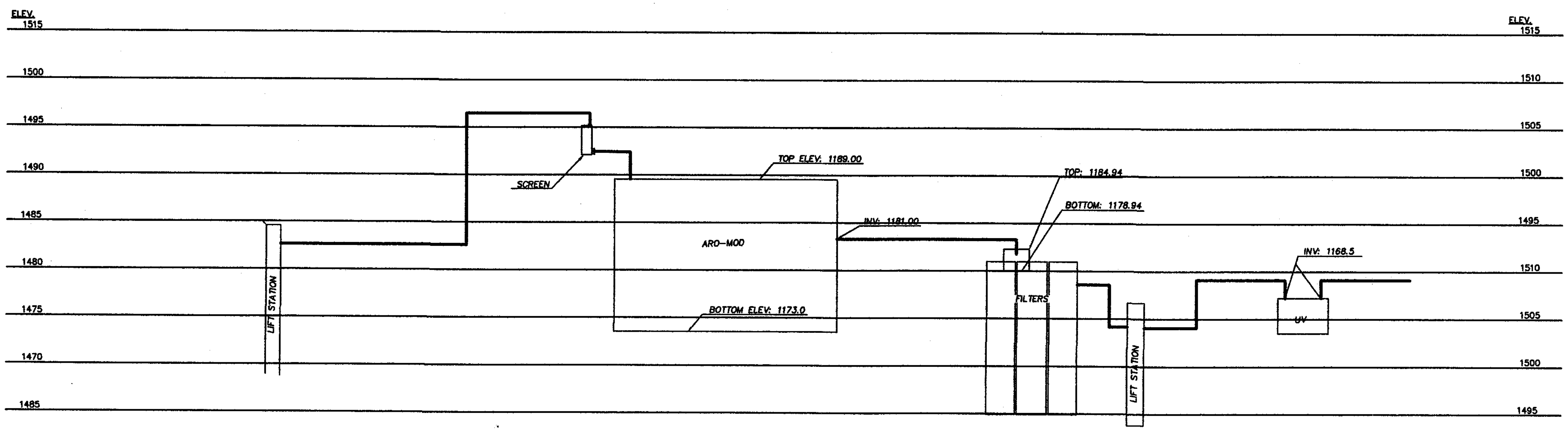
FACILITIES SITE PLAN

DESIGNED:	
DRAWN:	
CHECKED:	
DATE:	
SCALE:	
PROJECT:	
FILE NAME:	

EXHIBIT 7



PROCESS FLOW
N.T.S.



HYDRAULIC PROFILE
N.T.S.

SPECIFIC ENGINEERING, LLC.
5230 E. SHEA BOULEVARD SUITE 220
SCOTTSDALE, ARIZONA 85254
Phone: (480) 596-6335
FAX: (480) 596-6437

REVISIONS			
NO.	DATE	APP.	DESCRIPTION

DESIGNED
DRAWN
CHECKED
DATE
SCALE
PROJECT
FILE NAME

CLIENT/PROJECT

TITLE
PROCESS FLOW DIAGRAM

EXHIBIT 8

DEMONSTRATION OF FINANCIAL CAPABILITY

The estimated costs for construction, operation, and closure of the facility are shown below:

TABLE 9-1 MERRILL RANCH WATER RECLAMATION PLANT CONSTRUCTION, OPERATION, AND CLOSURE COSTS		
Construction	Phase 1	$6,827,493
	Phase 2	$3,544,013
	Phase 3	$5,575,200
	Phase 4	$3,544,013
	Total	$19,490,718
Operation		$271,040
Closure		$34,900

EXHIBIT 9A-1

TABLE 9 MERRILL RANCH WATER RECLAMATION PLANT CONSTRUCTION COSTS					
	Phase 1	Phase 2	Phase 3	Phase 4	Total
Flow Design (MGD)	1.4	1.4	1.4	1.4	5.6
Aero-Mod	$1,080,000	$1,080,000	$1,080,000	$1,080,000	$4,320,000
Installation Cost	$300,000	$225,000	$250,000	$225,000	$1,000,000
Concrete	$905,000	$870,000	$870,000	$870,000	$3,515,000
Sand Filter	$160,000	$160,000	$160,000	$160,000	$640,000
Concrete Basin	$70,000	$70,000	$70,000	$70,000	$280,000
Jones-Attwood Screen	$130,000		$130,000		$260,000
UV	$350,000		$350,000		$700,000
Concrete Basin	$10,000		$10,000		$20,000
Belt Press	$150,000		$150,000		$300,000
Odor Control	$150,000		$150,000		$300,000
Instrumentation	$50,000		$30,000		$80,000
Headworks Building	$375,000		$275,000		$650,000
Structural Engineer	$10,000	$5,000	$10,000	$5,000	$30,000
Mechanical Engineer	$10,000				$10,000
Inside Finish	$40,000		$25,000		$65,000
Structural Coating	$50,000	$40,000	$45,000	$40,000	$175,000
Doors/Windows/Vents	$20,000	$10,000	$10,000	$10,000	$50,000
Lift Station/Pumps	$150,000		$225,000		$375,000
Steel Pipe	$45,000	$25,000	$25,000	$25,000	$120,000
PVC Pipe	$35,000	$35,000	$35,000	$35,000	$140,000
Excavate & Backfill	$150,000	$75,000	$100,000	$75,000	$400,000
Landscaping/Paving	$200,000				$200,000
Fence	$40,000				$40,000
Emergency Power	$200,000				$200,000
HVAC - office/controllers	$25,000		$10,000		$35,000
Electrical 10%	$468,000	$259,500	$400,000	$259,500	$1,387,000
Contingincies (15%)	$613,950	$227,250	$438,000	$227,250	$1,506,450
APP Permit	$150,000				$150,000
Subtotal	$5,936,950	$3,081,750	$4,848,000	$3,081,750	$16,948,450
OH & P (15%)	$890,543	$462,263	$727,200	$462,263	$2,542,268
Total	$6,827,493	$3,544,013	$5,575,200	$3,544,013	$19,490,718
Cost/MG	$4.88	$2.53	$3.98	$2.53	$3.48

EXHIBIT 9A-2

ENGINEER'S OPINION OF PROBABLE COST
PROJECT: MERRILL LIFT STATION & FORCE MAIN
DATE: REVISED APRIL 07, 2004
SEWER FORCE MAIN

PROJECT NO. 3009
NO. of LOTS: 0
BY: Specific Engineering Services, LLC

Description	Unit	Approximate Quantity	Unit Price	TOTAL
10" C-900 DR18 PVC W/ FITTINGS	LF	**25,300**	14.00	$354,200.00
8" DIP W/ FITTINGS	LF	**80**	35.00	$2,800.00
4" DIP W/ FITTINGS	LF	**40**	20.00	$800.00
4" CHECK VALVE	EA	**1**	860.00	$860.00
4" GATE VALVE	EA	**3**	340.00	$1,020.00
VALVE VAULT	EA	**1**	2,200.00	$2,200.00
6" CLEANOUT	EA	**26**	600.00	$15,600.00
CONTROL PANEL	EA	**1**	5,000.00	$5,000.00
PUMP STATION (DUPLEX) COMPLETE	EA	**1**	75,000.00	$75,000.00
COMB. AIR/VACUUM RELEASE VALVE & VAULT	EA	**3**	3,500.00	$10,500.00
WARNING SIGNS	EA	**15**	150.00	$2,250.00
DIRECT BURIAL	LF	**80**	120.00	$9,600.00
4" WATER LINE WITH RISER	LF	**40**	20.00	$800.00
6' CHAIN LINK FENCE/BLOCK WALL	LF	**220**	30.00	$6,600.00
24' GATE(2-12' SWING GATES)	EA	**1**	1,000.00	$1,000.00
ACCESS ROAD	SY	**640**	3.00	$1,920.00
	TOTAL			**$490,150.00**

EXHIBIT 9B

APPENDIX

A	Reclaimed Wastewater Re-Use Permit Authorization
B	Aquifer Protection Permit Authorization
C	208 Amendment Checklist
D	ACC CC&N
E	Sewer Basin Flows
F	ADEQ Correspondence

APPENDIX A
RECLAIMED WASTEWATER
RE-USE PERMIT AUTHORIZATION

RECLAIMED WASTEWATER
RE-USE PERMIT AUTHORIZATION

Authorization is Pending

APPENDIX B
AQUIFER PROTECTION PERMIT AUTHORIZATION

AQUIFER PROTECTION PERMIT AUTHORIZATION

APP Authorization is Pending

APPENDIX C
208 AMENDMENT CHECKLIST

MERRILL RANCH PHASE 1
AMENDMENT
208 AMENDMENT CHECKLIST
SECTION 208, CLEAN WATER ACT

AUTHORITY

1. **Requirement**: - Proposed Designated Management Agency (DMA) shall self-certify that it has the authorities required by Section 208(c)(2) of the Clean Water Act to implement the plan for its proposed planning and service areas. Self-certification shall be in the form of a legal opinion by the DMA or entity attorney.

   Summary: Does not apply; Johnson Utility Company is not a DMA.

   Addressed on Page: 5.

20-YEAR NEEDS

2. **Requirement**:: - Clearly describe the existing wastewater (WW) treatment facilities:

   - Describe the existing WWTP facilities.

   Summary: Currently, there are no existing facilities in the vicinity of the Merrill Ranch Phase 1 area. A WWTP is proposed for each site. All plants will be Aero-mod Extended aeration treatment plants. The Merrill Ranch Phase ` development will have a total capacity of 2.5 MGD.

   Addressed on Page: 1.

3. **Requirement::** - Show WWTP certified and service areas for private utilities and sanitary district boundaries if appropriate.

   Summary: Johnson Utilities Company has been formed as a utility company registered with the Arizona Corporation Commission to provide water and sewer service for the Johnson Ranch area. The current Franchise Areas are as shown in Exhibit 2. The existing CC&N boundaries are as shown on Exhibit 3.

   Addressed on Page: 5.

4. **Requirement::** Clearly describe alternatives and the recommended WWTP plan:

- Provide POPTAC population estimates (or COG-approved estimates only where POPTAC not available) over 20-year period.

Summary: The total planning area for Merrill Ranch Phase 1 area totals 2110 acres with 7997 dwelling units. The project will be developed in approximately four phases consisting primarily of family and adult residential property.

Addressed on Page: 9,10, and Appendix E.

5. **Requirement::** - Provide wastewater flow estimates over the 20-year planning period.

Summary: Wastewater flow estimates are: 2.6 per/D.U. x 90 GPCD = 234 Gal/D.U.

Treatment facility estimates are:
Merrill Ranch, Phase 1, 2.5 MGD.

It is anticipated that the wastewater treatment facilities will be at full capacity within the next 15 to 20 years.

Addressed on Page: 9,10, and Appendix E.

6. **Requirement::** - Illustrate the WWT planning and service areas.

Summary: The WRP will service Merrill Ranch project within the CC&N areas.

Addressed on Page: 7, 8, and Exhibits 5a - 5d, and 6.

7. **Requirement::** - Describe the type and capacity of the recommended WRP Plant.

Summary: The WRP will be sized for a total capacity of 2.5 MGD. The plant will be Aero-Mod Extended Aeration Water Reclamation Plant with effluent reuse on turf areas.

Addressed on Page: 2, 4, 6, 8, and 12..

8. **Requirement::** - Identify water quality problems, consider alternative control measures, and recommend solution for implementation.

Summary: Johnson Utilities service area. Johnson Utilities will work improve the quality of the groundwater in this area by meeting effluent reuse standards for open-access golf courses and meeting Class D reclaimed water requirements, which is equivalent to secondary treatment and disinfection. To prevent future nitrate problems, Johnson Utilities will not approve septic tanks, except for existing or previously approved septic tank systems for developments within the the Johnson Utilities service area.

Addressed on Page: 2, 3, 38, and 12.

9. **Requirement:-** If private WWTP utilities with certificated areas are within the proposed regional service area, define who (municipal or private utility) serves what area and when. Identify whose sewer lines can be approved in what areas and when?

Summary: A portion of Merrill Ranch project is located within the existing sewer and water certificated areas of Johnson Utilities, L.L.C.

Addressed on Page; Exhibits 2 and 3.

10. **Requirement::** - Describe method of effluent disposal and reuse sites (if appropriate).

Summary: The treated effluent will be used for irrigation of the golf courses that have been constructed within the projects as well as irrigation uses within other open spaces and landscaping within the developments.

Addressed on Page: 2, 8, and 9.

11. **Requirement::** - If Sanitary Districts are within a proposed planning or service area, describe who serves the Sanitary Districts and when.

Summary: There are no existing Sanitary Districts in the proximity of the Merrill Ranch project, other than Johnson Utilities, L.L.C.

Addressed on Page: 1.

12. **Requirement::** - Describe the ownership of land proposed for plant sites and reuse areas.

Summary: The proposed sites for the wastewater treatment plants are owned by various entities. The reuse areas (golf course, open space, etc.) is currently owned by the corresponding entity. George H. Johnson, is the owner of Johnson Utilities Co., L.L.C.

Addressed on Page: 3, and 7.

13. **Requirement::** - Address time frames in the development of the treatment works.

Summary: The first phase, phase A, of the WRPs will initially commence operation in mid 2005. the project is expected to be completed within the next 5 years.

Addressed on Page: 6.

14. **Requirement::** - Address financial constraints in the development of the treatment works.

Summary: The project financing for Johnson Utilities is described within Section 8, Project Financing.

Addressed on Page: 17 and Exhibit 9.

15. **Requirement::** - Describe how discharges will comply with EPA municipal and industrial stormwater discharge regulations (Section 405, CWA).

Summary: All runoff will be directed through landscaped retention basins along with sediment removal and bio-filtration.

Addressed on Page: 4, 7, 34, and 12.

16. **Requirement::** - Describe how open areas and recreational opportunities will result from improved water quality and how those will be used.

Summary: Effluent treated to the required standards will be used to irrigate the golf course, neighborhood parks, trails and other open activity areas, thus encouraging recreational opportunities for the area residents.

Addressed on Page: 5, 7, 8, 9, and 12.

17. **Requirement::** - Describe potential use of lands associated with treatment works and increased access to water-based recreation, if applicable.

Summary: The property contained within the required setbacks will be used for acceptable non-residential uses such as Golf Course corridors which will provide beneficial activities and services to the area residents. Additional uses will include equestrian facilities, RV storage and open activity areas.

Addressed on Page: 1, 2, 4, 5, 7, and 12.

REGULATIONS

18. **Requirement::** - Describe types of permits needed, including NPDES, APP and reuse.

Summary: Permits required for the project include an Individual Aquifer Protection Program Permit (APP), and a Reclaimed Water Permit. The APP and Reclaimed Permit will be applied for starting in 2001. A National Pollution Discharge Elimination System Permit for effluent discharge and sludge disposal will be required for the Merrill Ranch only. The permit will be applied for as part of the phasing plan for the WWTP. A Stormwater Pollution Permit will be applied for as part of the grading permit application.

Addressed on Page: Section 4

19. **Requirement::** - Describe restrictions on NPDES permits, if needed, for discharge and sludge disposal.

Summary: A NPDES Permit for discharge will be required for the Merrill Ranch WRP.

Addressed on Page: 14

20. **Requirement::** - Provide documentation of communication with ADEQ Permitting Section 30 to 60 days prior to public hearing regarding the need for specific permits.

Summary: Meetings have been held with representatives from the ADEQ Permitting Section, and representatives of CAAG throughout the development of this plan. Specific Engineering, LLC has been in regular contact with ADEQ engineering department, and any ADEQ meeting will be attended by Specific Engineering, *LLC* staff to discuss modifications to the APP permit.

Addressed on Page: Appendix F

21. **Requirement::** - Describe pre-treatment requirements and method of adherence to requirements (Section 208 (b)(2)(D), CWA).

Summary: A pre-treatment program has been proposed in conformance with the Clean Water Act for Non-Domestic Waste.

Addressed on Page: 14.

22. **Requirement::** - Identify, if appropriate, specific pollutants that will be produced from excavations and procedures that will protect ground and surface water quality (Section 208 (b)(2)(K) and Section 304, CWA).

Summary: A NPDES Stormwater Pollution Prevention Permit will be obtained by the contractor prior to all construction of facilities within the proposed construction sites.

Addressed on Page: 14.

23. **Requirement::** - Describe alternatives and recommendation in the disposition of sludge generated. (Section 405 CWA)

Summary: Sludge will be disposed of at a landfill which is state certified to accept wastewater sludge. Butterfield Station, located in Mobile, Arizona, will accept sludge from the wastewater treatment plant for disposal.

Addressed on Page: 14 and 15.

24. **Requirement::** - Define any non-point issues related to the proposed facility and outline procedures to control them.

Summary: The only opportunity for non-point discharges is from the golf courses. The courses have been designed to retain runoff within the fairways and corridors.

Addressed on Page: 15.

25. **Requirement::** - Define the process to handle all mining runoff, orphan sites and underground pollutants, if applicable.

Summary: Not applicable. There are no mining activities involved within this project.

Addressed on Page: N/A.

26. **Requirement::** - If mining related, define where collection of pollutants has occurred, and what procedures are going to be initiated to contain contaminated areas.

Summary: Not applicable. There are no mining activities involved within this project.

Addressed on Page: N/A.

27. **Requirement::** - If mining related, define what specialized procedures will be initiated for orphan sites, if applicable.

Summary: Not applicable. There are no mining activities involved within this project.

Addressed on Page: N/A.

CONSTRUCTION

28. **Requirement::** - Define construction priorities and time schedules for initiation and completion.

Summary: The WRP will be built starting in 2005, and should be competed by 2006.

Addressed on Page: 5, 6, and 12.

29. **Requirement::** - Identify agencies who will construct, operate and maintain the facilities and otherwise carry out the plan.

Summary: Johnson Utilities will provide water and sewer service for the Johnson Ranch Project. Johnson Utilities will construct, operate and maintain the water and sewer facilities.

Addressed on Page: 1.

30. **Requirement::** - Identify construction activity-related sources of pollution and set forth procedures and methods to control, to the extent feasible, such sources.

Summary: The contractor shall comply with NPDES and OSHA Permit regulations as they apply to construction activities and materials.

Addressed on Page: 14 and 15.

FINANCING AND OTHER MEASURES NECESSARY TO CARRY OUT THE PLAN

31. **Requirement::** - If plan proposes to take over certificated private utility, describe how, when and financing will be managed.

Summary: This item is not applicable. Johnson Utilities is the utility company approved by ACC.

Addressed on Page: 17.

32. **Requirement:**: - Describe any significant measure necessary to carry out the plan, e.g., institutional, financial, economic, etc.

Summary: The project financing for Johnson Utilities is described within Section 8, Project Financing. The CC&N has been approved by the ACC.

Addressed on Page: 17 and Exhibit 9.

33. **Requirement::** - Describe proposed method(s) of community financing.

Summary: The project financing for Johnson Utilities is described within Section 8, Project Financing.

Addressed on Page: 17, and Exhibit 9.

34. **Requirement::** - Provide financial information to assure DMA has financial capability to operate and maintain wastewater system over its useful life.

Summary: Although Johnson Utilities is not a DMA, the project financing for Johnson Utilities is described within Section 7, Project Financing.

Addressed on Page: 17.

35. **Requirement::** - Provide a time line outlining period of time necessary for carrying out plan implementation.

Summary: The Builders have estimated 5 years for the project to be built out. At full buildout, the wastewater treatment plant will have a capacity of 2.5 MGD (Merrill Ranch), to serve the needs of the project. Treatment and collection capacity will be built in phases to match the growth of the development. It is anticipated that the plant will be operating at 100% efficiency within the next 15 to 20 years.

Addressed on Page: 6, and Appendix E.

36. **Requirement::** -Provide financial information indicating the method and measures necessary to achieve project financing. (Section 201 CWA or Section 604 may apply.)

Summary: The project financing for Johnson Utilities is described within Section 8, Project Financing.

Addressed on Page: 17, and Exhibit E.

IMPLEMENTABILITY

37. **Requirement:**: Describe impacts and implementability of Plan:

- Describe impacts on existing wastewater (WW) facilities, e.g., sanitary district, infrastructure/facilities and certificated areas.

Summary: There are no sanitary districts within the area, and the existing wastewater treatment facilities are owned and operated by Johnson Utilities Co., L.L.C. Johnson Utilities is currently serving a portion of the certificated area, and the development of the WRP will allow for expansion of its treatment capabilities.

Addressed on Page: 3, 5, 7, 11, and 12 and Exhibits 2 and 3.

38. **Requirement:**- Describe how and when existing package plants will be connected to a regional system.

Summary: There are no existing regional wastewater treatment plants within the area of Merrill Ranch, and the system will therefore not be connected to one.

Addressed on Page: 1, 3, 4, and 7.

39. **Requirement:** - Describe the impact on communities and businesses affected by the plan.

Summary: The proposed water reclamation plant will have a beneficial affect on the area by providing better treatment of wastewater, eliminating a potential source of groundwater contamination, creating capacity for growth by providing the necessary infrastructure and creating recreational areas by the reuse of treated effluent as an irrigation source. The facilities also make housing available for the work force in the Florence area and creates employment opportunities in the southeast valley area.

Addressed on Page: 7 and 8.

40. **Requirement::** - If a municipal wastewater (WWT) system is proposed, describe how WWT service will be provided until the municipal system is completed; i.e., will package plants and septic systems be allowed and under what circumstances. (Interim services.)

Summary: Sewer service will be provided by an Aero-Mode Extended Aeration mechanical treatment facility will be operational before the proposed subdivisions are developed. It is anticipated the mechanical treatment plant will be operational by 2005.

Addressed on Page: 3, 5, and 6.

PUBLIC PARTICIPATION

41. **Requirement::** - Submit copy of mailing list used to notify the public of the public hearing on the 208 amendment. (40 CFR, Chapter 1, Part 25.5)

Summary: Provided by CAAG.

Addressed on Page: N/A.

42. **Requirement:** - List location where documents are available for review at least 30 days before public hearing.

Summary: Provided by CAAG.

Addressed on Page: N/A.

43. **Requirement::** - Submit copy of the public notice of the public hearing as well as an official affidavit of publication from the area newspaper. Clearly show the announcement appeared in the newspaper at least 45 days before the hearing.

Summary: Provided by CAAG.

Addressed on Page: N/A.

44. **Requirement::** - Submit affidavit of publication for official newspaper publication.

Summary: Provided by CAAG.

Addressed on Page: N/A.

45. **Requirement::** - Submit responsiveness summary for public hearing.

Summary: Provided by CAAG.

Addressed on Page: N/A.

APPENDIX D
ACC CC&N

ACC CC&N

C C & N is Pending

APPENDIX E
SEWER BASIN FLOWS

MERRILL RANCH - SEWER BASIN FLOWS PHASE ONE

Subbasin Area	Zoning	Area Sewered (Acres)	Common/ School Area Sewered (Acres)	Dwelling Units Sewered	Population	Pop Peaking Factor	Storm Inflow (MGD)	Avg. Daily Flow (MGD)	Peak Dry Weather Flow (MGD)	Peak Wet Weather Flow (MGD)
A-AA-4.2	R-2	112.1		471	1224	2.34	0.028	0.110	0.258	0.286
B-AA-4.2	R-2	43.3		182	473	2.67	0.011	0.043	0.114	0.124
C-AA-4.2	R-2	23.2		97	253	3.02	0.006	0.023	0.069	0.075
D-AA-4.2	R-2	46.2		194	505	2.64	0.012	0.045	0.120	0.131
E-AA-4.2	R-2	45.6		192	498	2.65	0.011	0.045	0.119	0.130
F-AA-4.2	R-2	7.5		32	82	3.62	0.002	0.007	0.027	0.029
G-AA-4.2	R-2	48.5		204	530	2.62	0.012	0.048	0.125	0.137
H-AA-4.2	R-2	35.9		151	392	2.76	0.009	0.035	0.097	0.106
I-COMM	C-2	0	6.8			3	0.002	0.007	0.020	0.022
J-CHC	C-2	0	16			3	0.004	0.016	0.048	0.052
K-F-3.7	R-1	66.1		245	636	2.55	0.017	0.057	0.146	0.162
L-F-3.7	R-1	75.9		281	730	2.85	0.019	0.066	0.187	0.206
M-ESCL	C-2		15			3	0.004	0.015	0.045	0.049
N-F-3.7	R-1	27.6		102	266	3.02	0.007	0.024	0.072	0.079
O-AA-4.2	R-2	53.1		223	580	2.58	0.013	0.052	0.135	0.148
P-AA-4.2	R-2	76.6		322	836	2.45	0.019	0.075	0.184	0.204
Q-AA-4.2	R-2	83.7		352	914	2.42	0.021	0.082	0.199	0.220
R-AA-4.2	R-2	42.4		178	463	2.69	0.011	0.042	0.112	0.123
S-REC	C-2		17.8			3	0.004	0.018	0.053	0.058
T-REC	C-2		20			3	0.005	0.020	0.060	0.065
U-F-3.7	R-1	85.7		317	824	2.45	0.021	0.074	0.182	0.203
V-F-3.7	R-1	62.9		233	605	2.57	0.016	0.054	0.140	0.156
W-F-3.7	R-1	41.2		152	396	2.76	0.010	0.036	0.098	0.109
X-F-3.7	R-1	37.7		139	363	2.82	0.009	0.033	0.092	0.101
Y-F-3.7	R-1	24.7		91	238	3.08	0.006	0.021	0.066	0.072
Z-AA-4.2	R-2	49.2		169	439	2.72	0.012	0.040	0.108	0.120
AA-AA4.2	R-2	33.9		91	237	3.06	0.008	0.021	0.065	0.074
BB-AA4.2	R-2	71.3		189	491	2.65	0.018	0.044	0.117	0.135
CC-F-3.7	R-1	88.9		329	855	2.44	0.022	0.077	0.188	0.210
DD-F-3.7	R-1	29.8		110	287	2.93	0.007	0.026	0.076	0.083
EE-F-3.7	R-1	55.4		205	533	2.62	0.014	0.048	0.126	0.140
FF-F-3.7	R-1	21.7		80	209	3.15	0.005	0.019	0.059	0.065
GG-F-3.7	R-1	60.5		224	582	2.58	0.015	0.052	0.135	0.150
HH-F-3.7	R-1	57.7		213	555	2.6	0.014	0.050	0.130	0.144
II-HGHS	C-2		40			3	0.010	0.040	0.120	0.130
FIRE STA	C-2		2			3	0.001	0.002	0.006	0.007
PARK	OP	15	2			3	0.001	0.002	0.006	0.007
GLFCRS	RST RMS	234.6	5			3	0.001	0.005	0.015	0.016
TOTAL		**1757.9**	**124.6**	**5767.5**	**14995.4**		**0.4**	**1.5**	**3.9**	**4.3**
These are parcels within southern portion of Merrill Ranch that is not a portion of										
JJ-F-3.7	R-1	100		370	962	2.4	0.025	0.087	0.208	0.233
KK-F-3.7	R-1	330		1221	3175	2.09	0.083	0.286	0.597	0.680
LL-F-3.7	R-1	40		148	385	2.77	0.010	0.035	0.096	0.106
MM-F-3.7	R-1	172.5		638	1659	2.25	0.043	0.149	0.336	0.379
TOTAL		**642.5**	**0**	**2377.3**	**6180.9**	**9.5**	**0.2**	**0.6**	**1.2**	**1.4**
TOTAL		**2150.8**	**124.6**	**8144.7**	**21176.3**		**0.6**	**1.47**	**5.2**	**5.7**

APPENDIX F
ADEQ CORRESPONDENCE

ADEQ CORRESPONDENCE

Correspondence to be inserted by CAAG

ATTACHMENT 2

MERRILL RANCH

FLORENCE, ARIZONA

MASTER WASTEWATER COLLECTION SYSTEM REPORT
PULTE DEVELOPMENT WEST OF FELIX ROAD

NOVEMBER 2004

Prepared For:
Pulte Homes
15333 N. Pima Road, Suite 300
Scottsdale, Arizona 85260

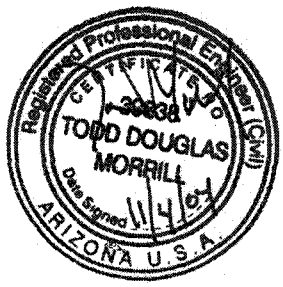
Prepared By:
Jack Johnson Company
5745 N. Scottsdale Road, Suite 130
Scottsdale, Arizona 85250

MERRILL RANCH

FLORENCE, ARIZONA

MASTER WASTEWATER COLLECTION SYSTEM REPORT
PULTE DEVELOPMENT WEST OF FELIX ROAD

NOVEMBER 2004



PROJECT ENGINEER

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MERRILL RANCH

FLORENCE, ARIZONA

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Introduction

Project Location

The Pulte Development portion of Merrill Ranch West of Felix Road (the Project) lies within the jurisdiction of the Town of Florence. The Project is a 2,000-acre (±) mixed-use Planned Unit Development (PUD) with low to medium-high density neighborhood housing, with several areas reserved for neighborhood businesses and commercial uses. An extensive trail network connects the lineal park system and natural desert spaces and community parks and is a part of the Open Space System. The Project is located primarily on desert scrublands, crossed by various minor drainage courses. There is a designated Federal Emergency Management Agency (FEMA) Flood Zone "A" on the western edge of the Merrill Ranch. Hunt Highway runs through the property.

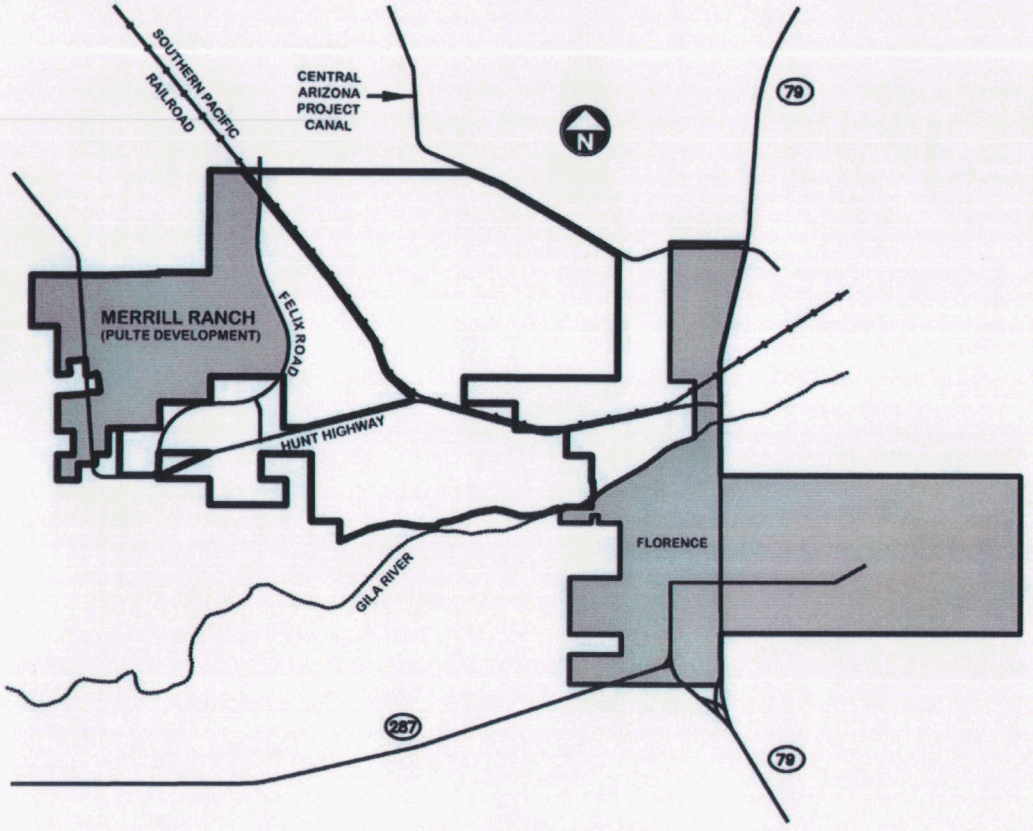


Figure 1. Project Location Map

Scope

The scope of this report is to provide the Master Wastewater Collection System design for the Project.

Specifically this report includes the following for the Project:

- Jurisdictional design criteria
- Wastewater system loads
- Hydraulic model for trunklines

Specifically this report does not address the following:

- Individual community wastewater main lengths, sizes, and locations (although approximate interceptor & trunk line point loading locations for developments/properties/parcels are indicated).
- Site specific or detailed design of infrastructure.

Jurisdictional Design Criteria

Jurisdiction

The Project lies within the jurisdictions of:

- Johnson Utilities Company
- Town of Florence, Arizona
- State of Arizona

Design Source Documents

The minimum design criteria, against which the Project and all associated developments are measured, as pertaining to wastewater systems, shall be in accordance with the following documents:

- **Johnson Utilities Company:** Johnson Utilities Company Design Guide and Standard Details, May 2003.
- **Town of Florence:** Development Codes Zoning Ordinance Subdivision Regulations, June 2000
- **Arizona State:** Engineering Bulletin No. 11 "Minimum Requirements for Design, Submission of Plans and Specifications of Sewage Works" Arizona Department of Environmental Quality, July 1978.
- **Arizona State:** Arizona Administrative Code R18-9-E301D

If, in any instance documents conflict, the most restrictive rule or regulation shall apply from the standpoint of capacity, level of service and public safety. The Engineer of Record shall bear the responsibility of interpretation of all such conflicts.

Wastewater System Loads

Loading Calculations

Wastewater loads were calculated using the methods prescribed by Johnson Utilities Company and were based on available planning and/or density estimations at the time of this report. Peaking factors have been applied per parcel or portions of parcels as defined by trunkline load points. Appropriate peaking factors shall be applied to each associated interior project/parcel for the purpose of designing local wastewater mains.

See "Wastewater Loads" (Appendix 1)

Exit Flows	
1.7 MGD	Treatment (Ave Day + Infiltration)
4.4 MGD	Collection (Peak Day + Infiltration)
3,058 GPM	Collection (Peak Day + Infiltration)

Table 1. Exit Flows

Hydraulic Model Parameters

Design Parameters & Assumptions

- Loads/Flows (as outlined in "Wastewater Loads")
- Pipes
  - Manning's "n" roughness coefficient = 0.013
  - Minimum design slopes:

Minimum Design Slopes for Circular Pipes (ADEQ) (velocities ≥ 2.0 fps & n=0.013)	
Diameter (in)	Slope (ft/ft)
8	0.0033
10	0.0024
12	0.0019
15	0.0014
18	0.0011
24	0.00077

Table 2. Minimum Design Slopes

- Manholes
  - Headloss - Standard Method

Hydraulic Model

Modeling Methodology

The software design package selected for electronic modeling is Haestad Methods SewerCad v5.5.

The output data provided/calculated by the electronic model is:

- System Schematic
- Manhole Report (rim elevation, sump elevation, headloss coefficient, base flow, total flow, velocity, HGL in, HGL out, EGL in, EGL out)
- Gravity Pipe Report (length, section size, Manning's n, constructed slope, depth in, depth out, total flow, design capacity, excess design capacity)
- Outlet Report (rim elevation, sump elevation, total flow, HGL in, HGL out, EGL in, EGL out)

See "Hydraulic Model Output Data" (Appendix 2)

Development & Infrastructure Phasing & Schedule Estimates

Phasing of the wastewater collection system infrastructure will follow and be dependent upon the sequence of project approvals. For any given sub-division all necessary downstream trunklines shall be constructed and approved prior to any sub-division being allowed to make a connection.

Conclusions

The data supplied by the model demonstrates that the system design represents an adequately sized system under gravity conditions for the assumptions as listed herein.

APPENDIX 1: WASTEWATER LOADS

MERRILL RANCH - PULTE DEVELOPMENT WEST OF FELIX ROAD
WASTEWATER LOADS
10/20/2004

Parcel	MH	Residential						Commercial				Infiltration (no design peaking factors applied)			Design Flows (Maximum)		
		D. U. (#)	Ave. Day	Peak Day				Average Day		Peak Day					Treatment	Collection	
			Flow (gpd)	Pop. (pers.)	Peaking Factor	Flow (gpd)	Flow (gpm)	Area (acre)	Flow (gpd)	Flow (gpd)	Flow (gpm)	Area (acre)	Flow (gpd)	Flow (gpm)	Flow (gpd)	Flow (System Loading) (gpd)	Flow (System Loading) (gpm)
1	117	86	13,950	155	3.62	50,500	35	0	0	0	0	22	5,520	4	19,470	56,020	39
2	92	137	32,039	356	2.90	92,914	65	0	0	0	0	33	8,150	6	40,189	101,064	70
3	128	106	17,204	191	3.62	62,278	43	0	0	0	0	27	6,808	5	24,011	69,086	48
4	93	102	23,921	266	3.14	75,113	52	0	0	0	0	24	6,085	4	30,006	81,198	56
5	118	118	19,036	212	3.14	59,773	42	0	0	0	0	30	7,533	5	26,569	67,306	47
6	91	141	33,101	368	2.90	95,992	67	0	0	0	0	34	8,420	6	41,521	104,412	73
7	130	75	12,118	135	3.62	43,867	30	0	0	0	0	19	4,795	3	16,913	48,662	34
8	90	125	29,248	325	2.90	84,820	59	0	0	0	0	30	7,440	5	36,688	92,260	64
9	119	117	18,941	210	3.14	59,476	41	0	0	0	0	30	7,495	5	26,436	66,971	47
10	94	190	44,423	494	2.74	121,718	85	0	0	0	0	45	11,300	8	55,723	133,018	92
11	113	88	14,247	158	3.62	51,574	36	0	0	0	0	23	5,638	4	19,885	57,212	40
12	76	119	27,961	311	2.90	81,086	56	0	0	0	0	28	7,113	5	35,073	88,198	61
13	137,121	142	22,934	255	3.14	72,014	50	0	0	0	0	36	9,075	6	32,009	81,089	56
14	16	50	11,597	129	3.62	41,981	29	0	0	0	0	12	2,950	2	14,547	44,931	31
15	32	63	10,235	114	3.62	37,051	26	0	0	0	0	16	4,050	3	14,285	41,101	29
16	75	119	27,813	309	2.90	80,658	56	0	0	0	0	28	7,075	5	34,888	87,733	61
17	103	103	16,654	185	3.62	60,288	42	0	0	0	0	26	6,590	5	23,244	66,878	46
18	142	82	19,253	214	3.14	60,455	42	0	0	0	0	20	4,898	3	24,151	65,352	45
19	112	75	12,074	134	3.62	43,707	30	0	0	0	0	19	4,778	3	16,851	48,484	34
20	173	181	42,457	472	2.74	116,332	81	0	0	0	0	43	10,800	8	53,257	127,132	88
21	124	98	15,896	177	3.62	57,544	40	0	0	0	0	25	6,290	4	22,186	63,834	44
22	72	135	31,548	351	2.90	91,489	64	0	0	0	0	32	8,025	6	39,573	99,514	69
23	104	133	21,576	240	3.14	67,749	47	0	0	0	0	34	8,538	6	30,113	76,286	53
24	23	115	27,007	300	2.90	78,321	54	0	0	0	0	27	6,870	5	33,877	85,191	59
25	127	82	13,205	147	3.62	47,801	33	0	0	0	0	21	5,225	4	18,430	53,026	37
26	25	90	21,111	235	3.14	66,287	46	0	0	0	0	21	5,370	4	26,481	71,657	50
27	109,135	91	14,822	165	3.62	53,656	37	0	0	0	0	23	5,865	4	20,687	59,521	41
28	24	133	31,027	345	2.90	89,978	62	0	0	0	0	32	7,893	5	38,919	97,871	68
29	35	91	14,708	163	3.62	53,244	37	0	0	0	0	23	5,820	4	20,528	59,064	41
30	62	126	29,563	328	2.90	85,732	60	0	0	0	0	30	7,520	5	37,083	93,252	65
31	88	135	21,848	243	3.14	68,602	48	0	0	0	0	35	8,645	6	30,493	77,247	54
32	70	155	36,167	402	2.74	99,098	69	0	0	0	0	37	9,200	6	45,367	108,298	75
33	58	127	20,515	228	3.14	64,416	45	0	0	0	0	32	8,118	6	28,632	72,533	50
34	69,133	334	78,211	869	2.46	192,400	134	0	0	0	0	80	19,895	14	98,106	212,295	147
35	61,134	129	20,849	232	3.14	65,467	45	0	0	0	0	33	8,250	6	29,099	73,717	51
36	68	158	37,012	411	2.74	101,414	70	0	0	0	0	38	9,415	7	46,427	110,829	77
37	51	114	18,417	205	3.14	57,829	40	0	0	0	0	29	7,288	5	25,704	65,117	45
38	67	333	77,966	866	2.46	191,795	133	0	0	0	0	79	19,833	14	97,798	211,628	147
39	50	105	17,090	190	3.62	61,866	43	0	0	0	0	27	6,763	5	23,853	68,629	48
41	52	80	13,015	145	3.62	47,115	33	0	0	0	0	21	5,150	4	18,165	52,265	36

MERRILL RANCH - PULTE DEVELOPMENT WEST OF FELIX ROAD
WASTEWATER LOADS
10/20/2004

Parcel	MH	Residential						Commercial				Infiltration (no design peaking factors applied)			Design Flows (Maximum)		
		D. U. (#)	Ave. Day	Peak Day				Average Day		Peak Day					Treatment	Collection	
			Flow (gpd)	Pop. (pers.)	Peaking Factor	Flow (gpd)	Flow (gpm)	Area (acre)	Flow (gpd)	Flow (gpd)	Flow (gpm)	Area (acre)	Flow (gpd)	Flow (gpm)	Flow (gpd)	Flow (System Loading) (gpd)	Flow (System Loading) (gpm)
43	53,136	96	15,605	173	3.62	56,492	39	0	0	0	0	25	6,175	4	21,780	62,667	44
45	49	98	15,795	176	3.62	57,178	40	0	0	0	0	25	6,250	4	22,045	63,428	44
47	48	124	20,142	224	3.14	63,245	44	0	0	0	0	32	7,970	6	28,112	71,215	49
49	45	71	11,436	127	3.62	41,397	29	0	0	0	0	18	4,525	3	15,961	45,922	32
51	98	196	31,678	352	2.90	91,868	64	0	0	0	0	50	12,535	9	44,213	104,403	73
53	47	145	23,427	260	3.14	73,561	51	0	0	0	0	37	9,270	6	32,697	82,831	58
55	46	154	24,931	277	3.14	78,283	54	0	0	0	0	39	9,865	7	34,796	88,148	61
A	36	120	19,459	312	2.90	56,432	39	0	0	0	0	29	7,150	5	26,609	63,582	44
B	57	25	4,001	64	3.62	14,483	10	0	0	0	0	6	1,470	1	5,471	15,953	11
C	56	0	0	0	0	0	0	22.56	22,560	67,680	47	23	5,640	4	28,200	73,320	51
D	82	0	0	0	0	0	0	12.01	12,010	36,030	25	12	3,003	2	15,013	39,033	27
E	108	0	0	0	0	0	0	6.92	6,920	20,760	14	7	1,730	1	8,650	22,490	16
F	83	0	0	0	0	0	0	10.00	10,000	30,000	21	10	2,500	2	12,500	32,500	23
G	78	0	0	0	0	0	0	18.00	18,000	54,000	38	18	4,500	3	22,500	58,500	41
H	139	0	0	0	0	0	0	12.02	12,020	36,060	25	12	3,005	2	15,025	39,065	27
I	139	0	0	0	0	0	0	0.50	500	1,500	1	1	125	0.1	625	1,625	1
J	100	0	0	0	0	0	0	0.50	500	1,500	1	1	125	0.1	625	1,625	1
K	138	0	0	0	0	0	0	2.00	2,000	6,000	4	2	500	0.3	2,500	6,500	5
L	26	0	0	0	0	0	0	17.03	17,030	51,090	35	17	4,258	3	21,288	55,348	38
M	71	0	0	0	0	0	0	16.00	16,000	48,000	33	16	4,000	3	20,000	52,000	36
N	60	0	0	0	0	0	0	5.63	5,630	16,890	12	6	1,408	1	7,038	18,298	13
O	60	0	0	0	0	0	0	1.96	1,960	5,880	4	2	490	0.3	2,450	6,370	4
P	100	0	0	0	0	0	0	18.04	18,040	54,120	38	18	4,510	3	22,550	58,630	41
Totals		**6,011**	**1,177,234**	**13,196**	**-**	**3,566,336**	**2,477**	**143**	**143,170**	**429,510**	**298**	**1,630**	**407,483**	**283**	**1,727,886**	**4,403,329**	**3,058**

Design Flow (gpm)	
All Parcels	3,058

Wastewater System Design Criteria:

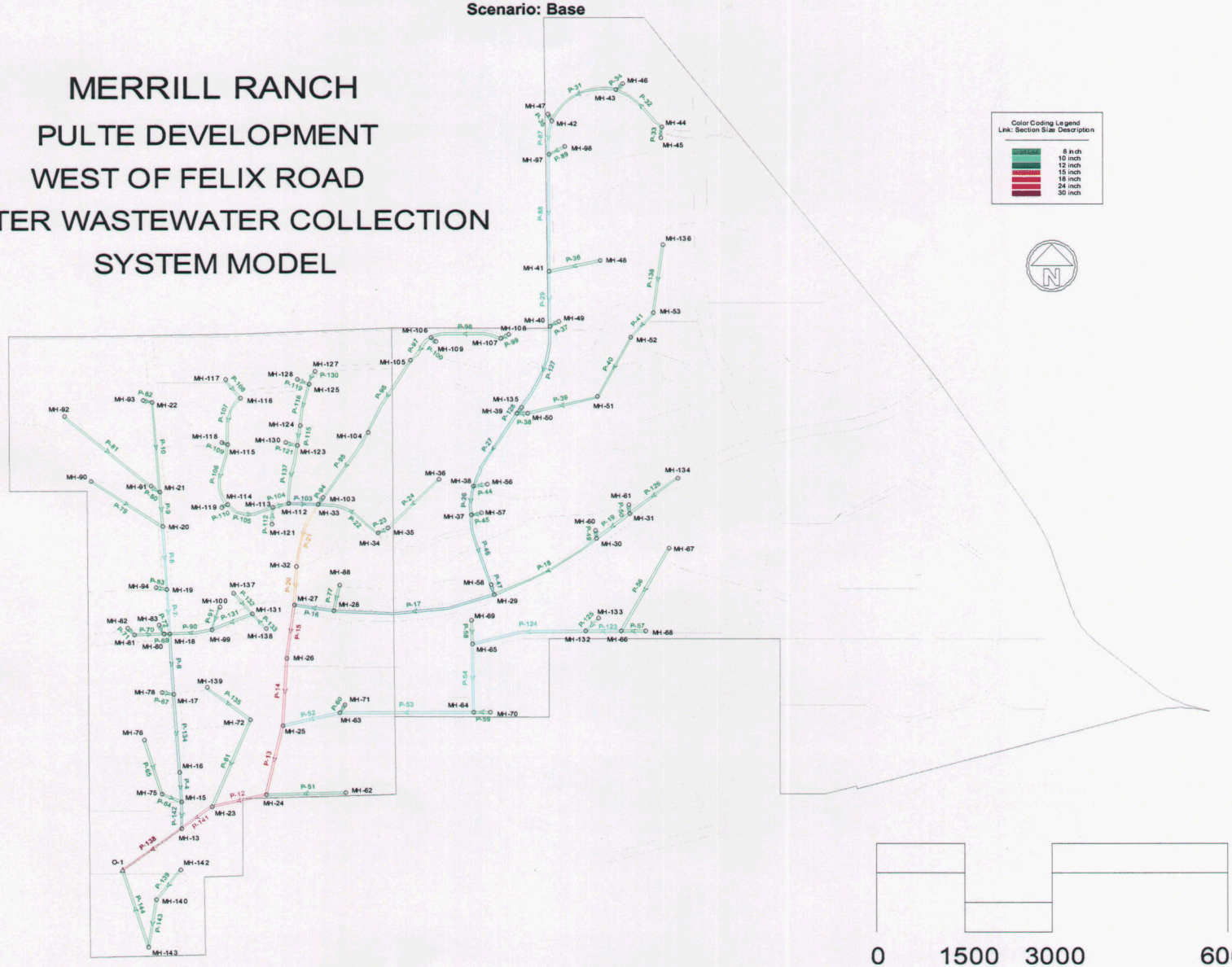
90	gpd per person (residentail areas requiring sewers)
2.6	persons/D.U. (all Family Community Residences)
1.8	persons/D.U. (all Adult Community Residences)
-	peaking factor (varies per contributing residential population density)
1,000	gpd per acre (all commercial and school areas)
3.0	peaking factor (all commercial and school areas)
250	gpd per acre (for wet weather flow infiltration and inflow)

Note that all calculations are based upon "Johnson Utilities Company Design Guide and Standard Details" May 2003.

APPENDIX 2: HYDRAULIC MODEL OUTPUT DATA

Scenario: Base

MERRILL RANCH
PULTE DEVELOPMENT
WEST OF FELIX ROAD
MASTER WASTEWATER COLLECTION SYSTEM MODEL



Title: MERRILL RANCH
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10/20/04 09:04:42 AM

Jack Johnson Company
 37 Brookside Road Waterbury, CT 06708 USA +1-203-755-1666

Project Engineer: JJC
SewerCAD v5.5 [5.5005]

Scenario: Base

Manhole Report

Label	Rim Elevation (ft)	Sump Elevation (ft)	Headloss Coefficient	Sanitary Pattern Load Base Flow (gpm)	Total Flow (gpm)	Velocity Out (ft/s)	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)	Energy Grade Line In (ft)	Energy Grade Line Out (ft)
MH-13	1,456.00	1,439.46	0.90	0.0	2,925.0	2.40	1,440.89	1,440.81	1,440.98	1,440.90
MH-15	1,458.00	1,448.32	0.80	0.0	674.0	3.64	1,449.00	1,448.84	1,449.21	1,449.05
MH-16	1,460.00	1,449.96	0.80	31.0	552.0	2.72	1,450.61	1,450.52	1,450.73	1,450.63
MH-17	1,470.00	1,454.36	1.00	0.0	521.0	2.69	1,455.01	1,454.90	1,455.12	1,455.01
MH-18	1,475.00	1,457.75	1.00	0.0	480.0	2.63	1,458.37	1,458.26	1,458.48	1,458.37
MH-19	1,478.00	1,468.12	0.80	0.0	355.0	3.13	1,468.63	1,468.51	1,468.79	1,468.66
MH-20	1,482.00	1,471.67	0.80	0.0	263.0	2.27	1,472.13	1,472.07	1,472.21	1,472.15
MH-21	1,485.00	1,476.04	0.80	0.0	199.0	2.78	1,476.45	1,476.35	1,476.57	1,476.47
MH-22	1,494.00	1,481.14	0.60	0.0	56.0	1.51	1,481.35	1,481.33	1,481.39	1,481.37
MH-23	1,454.00	1,439.94	1.00	59.0	2,251.0	2.17	1,441.39	1,441.32	1,441.47	1,441.39
MH-24	1,460.00	1,440.67	1.00	68.0	2,095.0	2.12	1,442.06	1,441.99	1,442.13	1,442.06
MH-25	1,459.00	1,447.75	1.00	50.0	1,962.0	4.55	1,448.87	1,448.55	1,449.19	1,448.87
MH-26	1,462.00	1,450.54	0.80	38.0	1,430.0	3.09	1,451.51	1,451.39	1,451.66	1,451.54
MH-27	1,465.37	1,452.28	0.80	0.0	1,392.0	2.78	1,453.28	1,453.18	1,453.40	1,453.31
MH-28	1,467.00	1,454.54	0.80	0.0	744.5	2.90	1,455.33	1,455.22	1,455.46	1,455.35
MH-29	1,490.00	1,475.55	0.80	0.0	690.5	3.67	1,476.24	1,476.08	1,476.45	1,476.29
MH-30	1,497.00	1,488.97	0.80	0.0	68.0	2.02	1,489.20	1,489.15	1,489.26	1,489.21
MH-31	1,503.00	1,492.50	0.60	0.0	51.0	1.70	1,492.69	1,492.66	1,492.74	1,492.71
MH-32	1,466.00	1,453.50	0.80	29.0	647.5	2.31	1,454.20	1,454.13	1,454.28	1,454.22
MH-33	1,470.00	1,455.66	1.00	0.0	618.5	2.28	1,456.36	1,456.28	1,456.44	1,456.36
MH-34	1,477.00	1,461.50	0.60	0.0	85.0	1.97	1,461.75	1,461.71	1,461.81	1,461.77
MH-35	1,481.00	1,462.49	0.80	41.0	85.0	1.97	1,462.75	1,462.70	1,462.81	1,462.76
MH-36	1,483.00	1,468.43	0.80	44.0	44.0	1.63	1,468.62	1,468.58	1,468.66	1,468.62
MH-37	1,487.00	1,478.23	0.80	0.0	572.5	2.21	1,478.98	1,478.92	1,479.06	1,479.00
MH-38	1,488.00	1,479.17	0.80	0.0	561.5	2.20	1,479.91	1,479.85	1,479.99	1,479.92
MH-39	1,492.56	1,481.92	0.80	0.0	510.5	2.16	1,482.61	1,482.56	1,482.69	1,482.63
MH-40	1,497.50	1,485.01	0.80	0.0	317.0	1.93	1,485.53	1,485.48	1,485.59	1,485.54
MH-41	1,498.32	1,487.26	0.80	0.0	273.0	2.03	1,487.76	1,487.71	1,487.82	1,487.77
MH-42	1,500.00	1,493.60	0.90	0.0	151.0	1.81	1,493.96	1,493.91	1,494.01	1,493.96
MH-43	1,505.28	1,497.93	0.90	0.0	93.0	1.74	1,498.22	1,498.18	1,498.27	1,498.23
MH-44	1,509.00	1,501.26	0.60	0.0	32.0	1.28	1,501.42	1,501.40	1,501.45	1,501.43
MH-45	1,508.50	1,501.91	0.80	32.0	32.0	1.28	1,502.07	1,502.05	1,502.10	1,502.08
MH-46	1,506.00	1,498.46	0.80	61.0	61.0	1.55	1,498.69	1,498.66	1,498.73	1,498.70
MH-47	1,500.00	1,494.02	0.80	58.0	58.0	1.53	1,494.24	1,494.21	1,494.28	1,494.25
MH-48	1,502.50	1,490.21	0.80	49.0	49.0	1.45	1,490.41	1,490.39	1,490.45	1,490.42
MH-49	1,498.68	1,485.55	0.80	44.0	44.0	1.42	1,485.74	1,485.72	1,485.77	1,485.75
MH-50	1,494.23	1,483.06	0.80	48.0	173.0	2.64	1,483.44	1,483.35	1,483.55	1,483.46
MH-51	1,504.00	1,491.29	0.90	45.0	125.0	2.41	1,491.62	1,491.53	1,491.71	1,491.62
MH-52	1,507.00	1,499.09	0.80	36.0	80.0	2.12	1,499.34	1,499.28	1,499.41	1,499.35
MH-53	1,508.00	1,500.94	0.80	22.0	44.0	1.41	1,501.13	1,501.11	1,501.16	1,501.14
MH-56	1,489.00	1,479.93	0.80	51.0	51.0	1.46	1,480.14	1,480.11	1,480.17	1,480.15
MH-57	1,489.00	1,479.10	0.80	11.0	11.0	1.08	1,479.19	1,479.18	1,479.21	1,479.20
MH-58	1,489.00	1,475.89	0.80	50.0	622.5	2.26	1,476.68	1,476.62	1,476.76	1,476.70
MH-60	1,497.00	1,489.44	0.80	17.0	17.0	1.06	1,489.56	1,489.55	1,489.58	1,489.56
MH-61	1,503.50	1,492.99	0.80	25.5	25.5	1.19	1,493.14	1,493.12	1,493.16	1,493.14
MH-62	1,468.00	1,445.15	0.80	65.0	65.0	1.57	1,445.39	1,445.36	1,445.43	1,445.40
MH-63	1,468.00	1,460.00	9.00	0.0	482.0	3.47	1,462.14	1,460.46	1,462.33	1,460.65
MH-64	1,485.00	1,467.50	0.80	0.0	446.0	2.56	1,468.14	1,468.06	1,468.24	1,468.16
MH-65	1,489.50	1,470.27	0.80	0.0	371.0	2.17	1,470.88	1,470.82	1,470.95	1,470.89
MH-66	1,494.00	1,477.93	0.80	0.0	224.0	2.17	1,478.35	1,478.30	1,478.43	1,478.37
MH-67	1,495.00	1,483.33	0.80	147.0	147.0	1.96	1,483.70	1,483.65	1,483.76	1,483.71
MH-68	1,494.00	1,479.29	0.80	77.0	77.0	1.65	1,479.55	1,479.52	1,479.59	1,479.56
MH-69	1,490.00	1,472.30	0.80	73.5	73.5	1.89	1,472.54	1,472.50	1,472.60	1,472.55

Scenario: Base

Manhole Report

Label	Rim Elevation (ft)	Sump Elevation (ft)	Headloss Coefficient	Sanitary Pattern Load Base Flow (gpm)	Total Flow (gpm)	Velocity Out (ft/s)	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)	Energy Grade Line In (ft)	Energy Grade Line Out (ft)
MH-70	1,481.00	1,468.47	0.80	75.0	75.0	1.63	1,468.73	1,468.69	1,468.77	1,468.73
MH-71	1,468.00	1,460.54	0.80	36.0	36.0	0.23	1,462.15	1,462.15	1,462.15	1,462.15
MH-72	1,460.00	1,445.28	0.80	69.0	97.0	1.76	1,445.57	1,445.54	1,445.62	1,445.58
MH-75	1,461.00	1,449.72	0.80	61.0	122.0	1.98	1,450.05	1,450.00	1,450.11	1,450.06
MH-76	1,468.00	1,452.95	0.80	61.0	61.0	1.54	1,453.18	1,453.15	1,453.22	1,453.19
MH-78	1,472.00	1,455.04	0.80	41.0	41.0	1.38	1,455.23	1,455.20	1,455.26	1,455.23
MH-80	1,477.00	1,458.28	0.80	0.0	50.0	1.69	1,458.48	1,458.44	1,458.52	1,458.49
MH-81	1,480.00	1,460.74	0.60	0.0	27.0	1.41	1,460.88	1,460.86	1,460.91	1,460.89
MH-82	1,480.00	1,461.60	0.80	27.0	27.0	1.41	1,461.74	1,461.72	1,461.78	1,461.75
MH-83	1,478.00	1,459.14	0.80	23.0	23.0	1.34	1,459.27	1,459.25	1,459.30	1,459.28
MH-88	1,470.00	1,456.05	0.80	54.0	54.0	1.49	1,456.27	1,456.24	1,456.30	1,456.27
MH-90	1,494.00	1,486.14	0.80	64.0	64.0	1.99	1,486.36	1,486.31	1,486.42	1,486.37
MH-91	1,486.00	1,476.64	0.80	73.0	143.0	1.94	1,477.00	1,476.96	1,477.06	1,477.02
MH-92	1,500.00	1,482.90	0.80	70.0	70.0	1.60	1,483.15	1,483.11	1,483.19	1,483.15
MH-93	1,495.00	1,481.68	0.80	56.0	56.0	1.50	1,481.90	1,481.87	1,481.93	1,481.91
MH-94	1,479.00	1,468.73	0.80	92.0	92.0	1.72	1,469.02	1,468.98	1,469.06	1,469.03
MH-97	1,500.00	1,492.03	0.80	0.0	224.0	1.93	1,492.48	1,492.43	1,492.53	1,492.49
MH-98	1,500.00	1,493.06	0.80	73.0	73.0	1.62	1,493.31	1,493.28	1,493.35	1,493.32
MH-99	1,471.00	1,460.11	0.80	0.0	75.0	1.63	1,460.37	1,460.33	1,460.41	1,460.37
MH-100	1,472.00	1,461.47	0.80	42.0	42.0	1.39	1,461.66	1,461.64	1,461.69	1,461.67
MH-103	1,471.00	1,456.38	0.80	46.0	135.5	2.23	1,456.72	1,456.65	1,456.79	1,456.73
MH-104	1,475.00	1,463.13	0.80	53.0	89.5	2.00	1,463.40	1,463.35	1,463.46	1,463.41
MH-105	1,485.00	1,470.25	0.60	0.0	36.5	1.54	1,470.41	1,470.39	1,470.45	1,470.43
MH-106	1,483.00	1,472.85	0.80	0.0	36.5	1.54	1,473.02	1,472.99	1,473.06	1,473.03
MH-107	1,492.00	1,478.92	0.60	0.0	16.0	1.21	1,479.03	1,479.01	1,479.05	1,479.04
MH-108	1,492.00	1,479.73	0.80	16.0	16.0	1.21	1,479.84	1,479.82	1,479.86	1,479.85
MH-109	1,482.00	1,473.25	0.80	20.5	20.5	1.13	1,473.38	1,473.37	1,473.40	1,473.39
MH-112	1,470.00	1,456.88	0.80	34.0	398.0	2.23	1,457.45	1,457.38	1,457.52	1,457.46
MH-113	1,470.00	1,457.81	1.00	40.0	201.0	2.10	1,458.27	1,458.20	1,458.34	1,458.27
MH-114	1,476.00	1,461.96	0.80	0.0	133.0	2.23	1,462.29	1,462.23	1,462.37	1,462.31
MH-115	1,479.00	1,467.32	0.80	0.0	86.0	1.97	1,467.58	1,467.53	1,467.64	1,467.60
MH-116	1,481.00	1,471.62	0.60	0.0	39.0	1.57	1,471.79	1,471.76	1,471.83	1,471.80
MH-117	1,484.00	1,472.95	0.80	39.0	39.0	1.36	1,473.13	1,473.11	1,473.16	1,473.14
MH-118	1,480.00	1,467.70	0.80	47.0	47.0	1.43	1,467.90	1,467.88	1,467.93	1,467.91
MH-119	1,477.00	1,462.34	0.80	47.0	47.0	1.44	1,462.54	1,462.51	1,462.57	1,462.55
MH-121	1,469.00	1,458.74	0.80	28.0	28.0	1.23	1,458.89	1,458.88	1,458.92	1,458.90
MH-123	1,473.30	1,460.16	0.80	0.0	163.0	2.01	1,460.55	1,460.50	1,460.62	1,460.57
MH-124	1,475.00	1,461.32	0.80	44.0	129.0	1.89	1,461.66	1,461.62	1,461.72	1,461.67
MH-125	1,476.00	1,463.69	0.80	0.0	85.0	1.69	1,463.96	1,463.93	1,464.01	1,463.97
MH-127	1,477.00	1,464.49	0.80	37.0	37.0	1.34	1,464.67	1,464.65	1,464.70	1,464.67
MH-128	1,476.40	1,464.40	0.80	48.0	48.0	1.44	1,464.60	1,464.58	1,464.64	1,464.61
MH-130	1,474.10	1,460.81	0.80	34.0	34.0	1.30	1,460.98	1,460.96	1,461.01	1,460.99
MH-131	1,472.00	1,462.59	0.80	0.0	33.0	1.29	1,462.76	1,462.74	1,462.78	1,462.76
MH-132	1,490.00	1,475.93	0.80	0.0	297.5	2.23	1,476.44	1,476.38	1,476.52	1,476.45
MH-133	1,485.00	1,476.94	0.80	73.5	73.5	1.62	1,477.19	1,477.16	1,477.23	1,477.20
MH-134	1,500.00	1,495.87	0.80	25.5	25.5	1.20	1,496.02	1,496.00	1,496.04	1,496.02
MH-135	1,493.00	1,482.17	0.80	20.5	337.5	1.70	1,482.76	1,482.72	1,482.80	1,482.77
MH-136	1,509.00	1,504.80	0.80	22.0	22.0	1.15	1,504.94	1,504.92	1,504.96	1,504.94
MH-137	1,471.00	1,464.20	0.80	28.0	28.0	1.24	1,464.35	1,464.33	1,464.38	1,464.36
MH-138	1,470.00	1,463.72	0.80	5.0	5.0	0.74	1,463.79	1,463.78	1,463.79	1,463.79
MH-139	1,468.00	1,449.91	0.80	28.0	28.0	1.43	1,450.06	1,450.03	1,450.09	1,450.06
MH-140	1,455.00	1,445.76	0.80	0.0	45.0	1.41	1,445.96	1,445.93	1,445.99	1,445.96
MH-142	1,455.00	1,447.93	0.80	45.0	45.0	1.41	1,448.13	1,448.10	1,448.16	1,448.13

Scenario: Base

Manhole Report

Label	Rim Elevation (ft)	Sump Elevation (ft)	Headloss Coefficient	Sanitary Pattern Load Base Flow (gpm)	Total Flow (gpm)	Velocity Out (ft/s)	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)	Energy Grade Line In (ft)	Energy Grade Line Out (ft)
MH-143	1,449.00	1,443.10	0.80	88.0	133.0	1.92	1,443.45	1,443.40	1,443.51	1,443.46

Scenario: Base

Gravity Pipe Report

Label	Length (ft)	Section Size	Mannings n	Constructed Slope (ft/ft)	Average Velocity (ft/s)	Total Flow (gpm)	Design Capacity (gpm)	Excess Design Capacity (gpm)
P-4	497.00	12 inch	0.013	0.003300	2.72	552.0	918.5	366.5
P-6	1,027.00	12 inch	0.013	0.003301	2.63	480.0	918.7	438.7
P-7	754.00	10 inch	0.013	0.013753	4.15	355.0	1,153.2	798.2
P-8	1,076.00	10 inch	0.013	0.003299	2.27	263.0	564.8	301.8
P-9	584.00	8 inch	0.013	0.007483	2.87	199.0	469.1	270.1
P-10	1,544.00	8 inch	0.013	0.003303	1.51	56.0	311.7	255.7
P-12	947.00	24 inch	0.013	0.000771	2.19	2,095.0	2,818.9	723.9
P-13	1,218.00	18 inch	0.013	0.005813	4.63	1,962.0	3,594.4	1,632.4
P-14	1,140.00	18 inch	0.013	0.002447	3.09	1,430.0	2,332.3	902.3
P-15	916.00	18 inch	0.013	0.001900	2.78	1,392.0	2,054.7	662.7
P-16	687.00	12 inch	0.013	0.003290	2.90	744.5	917.1	172.6
P-17	2,772.00	12 inch	0.013	0.007579	3.94	690.5	1,392.1	701.6
P-18	1,995.00	8 inch	0.013	0.006727	2.05	68.0	444.8	376.8
P-19	704.00	8 inch	0.013	0.005014	1.70	51.0	384.0	333.0
P-20	643.00	15 inch	0.013	0.001897	2.31	647.5	1,262.9	615.4
P-21	1,138.00	15 inch	0.013	0.001898	2.28	618.5	1,263.1	644.6
P-22	1,167.00	8 inch	0.013	0.005004	1.97	85.0	383.7	298.7
P-23	198.00	8 inch	0.013	0.005000	1.97	85.0	383.5	298.5
P-24	1,187.00	8 inch	0.013	0.005004	1.63	44.0	383.7	339.7
P-26	494.00	12 inch	0.013	0.001903	2.20	561.5	697.5	136.0
P-27	1,446.00	12 inch	0.013	0.001902	2.16	510.5	697.3	186.8
P-29	934.00	10 inch	0.013	0.002409	2.03	273.0	482.6	209.6
P-31	1,309.00	8 inch	0.013	0.003308	1.74	93.0	311.9	218.9
P-32	1,015.00	8 inch	0.013	0.003281	1.28	32.0	310.6	278.6
P-33	198.00	8 inch	0.013	0.003283	1.28	32.0	310.7	278.7
P-34	159.00	8 inch	0.013	0.003333	1.55	61.0	313.1	252.1
P-35	126.00	8 inch	0.013	0.003333	1.53	58.0	313.1	255.1
P-36	893.00	8 inch	0.013	0.003303	1.45	49.0	311.7	262.7
P-37	160.00	8 inch	0.013	0.003375	1.42	44.0	315.1	271.1
P-38	174.00	8 inch	0.013	0.006552	2.64	173.0	439.0	266.0
P-39	1,235.00	8 inch	0.013	0.006664	2.43	125.0	442.7	317.7
P-40	1,171.00	8 inch	0.013	0.006661	2.14	80.0	442.6	362.6
P-41	560.00	8 inch	0.013	0.003304	1.41	44.0	311.7	267.7
P-44	232.00	8 inch	0.013	0.003276	1.46	51.0	310.4	259.4
P-45	174.00	8 inch	0.013	0.005000	1.08	11.0	383.5	372.5
P-46	1,233.00	12 inch	0.013	0.001898	2.21	572.5	696.6	124.1
P-47	180.00	12 inch	0.013	0.001889	2.23	622.5	695.0	72.5
P-49	142.00	8 inch	0.013	0.003310	1.06	17.0	312.0	295.0
P-50	150.00	8 inch	0.013	0.003267	1.19	25.5	310.0	284.5
P-51	1,359.00	8 inch	0.013	0.003297	1.57	65.0	311.4	246.4
P-52	999.00	10 inch	0.013	0.012262	4.31	482.0	1,088.9	606.9
P-53	2,271.00	10 inch	0.013	0.003303	2.56	446.0	565.1	119.1
P-54	1,156.00	10 inch	0.013	0.002396	2.17	371.0	481.4	110.4
P-56	1,634.00	8 inch	0.013	0.003305	1.96	147.0	311.8	164.8
P-57	411.00	8 inch	0.013	0.003309	1.65	77.0	312.0	235.0
P-58	404.00	8 inch	0.013	0.005025	1.89	73.5	384.4	310.9
P-59	296.00	8 inch	0.013	0.003277	1.63	75.0	310.5	235.5
P-60	162.00	8 inch	0.013	0.003333	0.23	36.0	313.1	277.1
P-61	1,619.00	8 inch	0.013	0.003298	1.76	97.0	311.5	214.5
P-64	364.00	8 inch	0.013	0.003846	1.98	122.0	336.3	214.3
P-65	977.00	8 inch	0.013	0.003306	1.54	61.0	311.8	250.8
P-67	206.00	8 inch	0.013	0.003301	1.38	41.0	311.6	270.6
P-69	107.00	8 inch	0.013	0.004953	1.69	50.0	381.7	331.7

Scenario: Base

Gravity Pipe Report

Label	Length (ft)	Section Size	Mannings n	Constructed Slope (ft/ft)	Average Velocity (ft/s)	Total Flow (gpm)	Design Capacity (gpm)	Excess Design Capacity (gpm)
P-70	491.00	8 inch	0.013	0.005010	1.41	27.0	383.9	356.9
P-71	172.00	8 inch	0.013	0.005000	1.41	27.0	383.5	356.5
P-72	173.00	8 inch	0.013	0.004971	1.34	23.0	382.4	359.4
P-77	455.00	8 inch	0.013	0.003319	1.49	54.0	312.4	258.4
P-79	1,447.00	8 inch	0.013	0.010000	2.32	64.0	542.3	478.3
P-80	183.00	8 inch	0.013	0.003279	1.94	143.0	310.5	167.5
P-81	1,897.00	8 inch	0.013	0.003300	1.60	70.0	311.6	241.6
P-82	166.00	8 inch	0.013	0.003253	1.50	56.0	309.3	253.3
P-83	187.00	8 inch	0.013	0.003262	1.72	92.0	309.8	217.8
P-87	587.00	10 inch	0.013	0.002675	1.81	151.0	508.5	357.5
P-88	1,987.00	10 inch	0.013	0.002401	1.93	224.0	481.8	257.8
P-89	312.00	8 inch	0.013	0.003301	1.62	73.0	311.6	238.6
P-90	718.00	8 inch	0.013	0.003287	1.63	75.0	310.9	235.9
P-91	413.00	8 inch	0.013	0.003293	1.39	42.0	311.2	269.2
P-94	145.00	8 inch	0.013	0.004966	2.23	135.5	382.2	246.7
P-95	1,350.00	8 inch	0.013	0.005000	2.00	89.5	383.5	294.0
P-96	1,424.00	8 inch	0.013	0.005000	1.54	36.5	383.5	347.0
P-97	518.00	8 inch	0.013	0.005019	1.54	36.5	384.2	347.7
P-98	1,217.00	8 inch	0.013	0.004988	1.21	16.0	383.0	367.0
P-99	161.00	8 inch	0.013	0.005031	1.21	16.0	384.7	368.7
P-100	120.00	8 inch	0.013	0.003333	1.13	20.5	313.1	292.6
P-103	507.00	12 inch	0.013	0.002406	2.23	398.0	784.4	386.4
P-104	286.00	8 inch	0.013	0.003252	2.10	201.0	309.3	108.3
P-105	829.00	8 inch	0.013	0.005006	2.23	133.0	383.7	250.7
P-106	1,075.00	8 inch	0.013	0.004986	1.97	86.0	383.0	297.0
P-107	860.00	8 inch	0.013	0.005000	1.57	39.0	383.5	344.5
P-108	402.00	8 inch	0.013	0.003308	1.36	39.0	312.0	273.0
P-109	116.00	8 inch	0.013	0.003276	1.43	47.0	310.4	263.4
P-110	114.00	8 inch	0.013	0.003333	1.44	47.0	313.1	266.1
P-112	284.00	8 inch	0.013	0.003275	1.23	28.0	310.4	282.4
P-115	353.00	8 inch	0.013	0.003286	1.89	129.0	310.9	181.9
P-116	718.00	8 inch	0.013	0.003301	1.69	85.0	311.6	226.6
P-119	216.00	8 inch	0.013	0.003287	1.44	48.0	310.9	262.9
P-121	197.00	8 inch	0.013	0.003299	1.30	34.0	311.5	277.5
P-123	608.00	10 inch	0.013	0.003289	2.17	224.0	564.0	340.0
P-124	1,947.00	10 inch	0.013	0.002907	2.23	297.5	530.2	232.7
P-125	307.00	8 inch	0.013	0.003290	1.62	73.5	311.1	237.6
P-126	1,024.00	8 inch	0.013	0.003291	1.20	25.5	311.1	285.6
P-127	1,500.00	12 inch	0.013	0.001893	1.93	317.0	695.8	378.8
P-128	133.00	12 inch	0.013	0.001880	1.95	337.5	693.3	355.8
P-130	242.00	8 inch	0.013	0.003306	1.34	37.0	311.8	274.8
P-131	751.00	8 inch	0.013	0.003302	1.29	33.0	311.7	278.7
P-132	485.00	8 inch	0.013	0.003320	1.24	28.0	312.5	284.5
P-133	343.00	8 inch	0.013	0.003294	0.74	5.0	311.3	306.3
P-134	1,333.00	12 inch	0.013	0.003301	2.69	521.0	918.7	397.7
P-135	925.00	8 inch	0.013	0.005005	1.43	28.0	383.7	355.7
P-136	1,168.00	8 inch	0.013	0.003305	1.15	22.0	311.8	289.8
P-137	994.00	8 inch	0.013	0.003300	2.01	163.0	311.5	148.5
P-138	1,242.00	30 inch	0.013	0.000773	2.40	2,925.0	5,118.0	2,193.0
P-139	658.00	8 inch	0.013	0.003298	1.41	45.0	311.5	266.5
P-141	622.00	24 inch	0.013	0.000772	2.22	2,251.0	2,820.5	569.5
P-142	448.00	12 inch	0.013	0.019777	5.57	674.0	2,248.7	1,574.7
P-143	807.00	8 inch	0.013	0.003296	1.41	45.0	311.4	266.4

Scenario: Base

Gravity Pipe Report

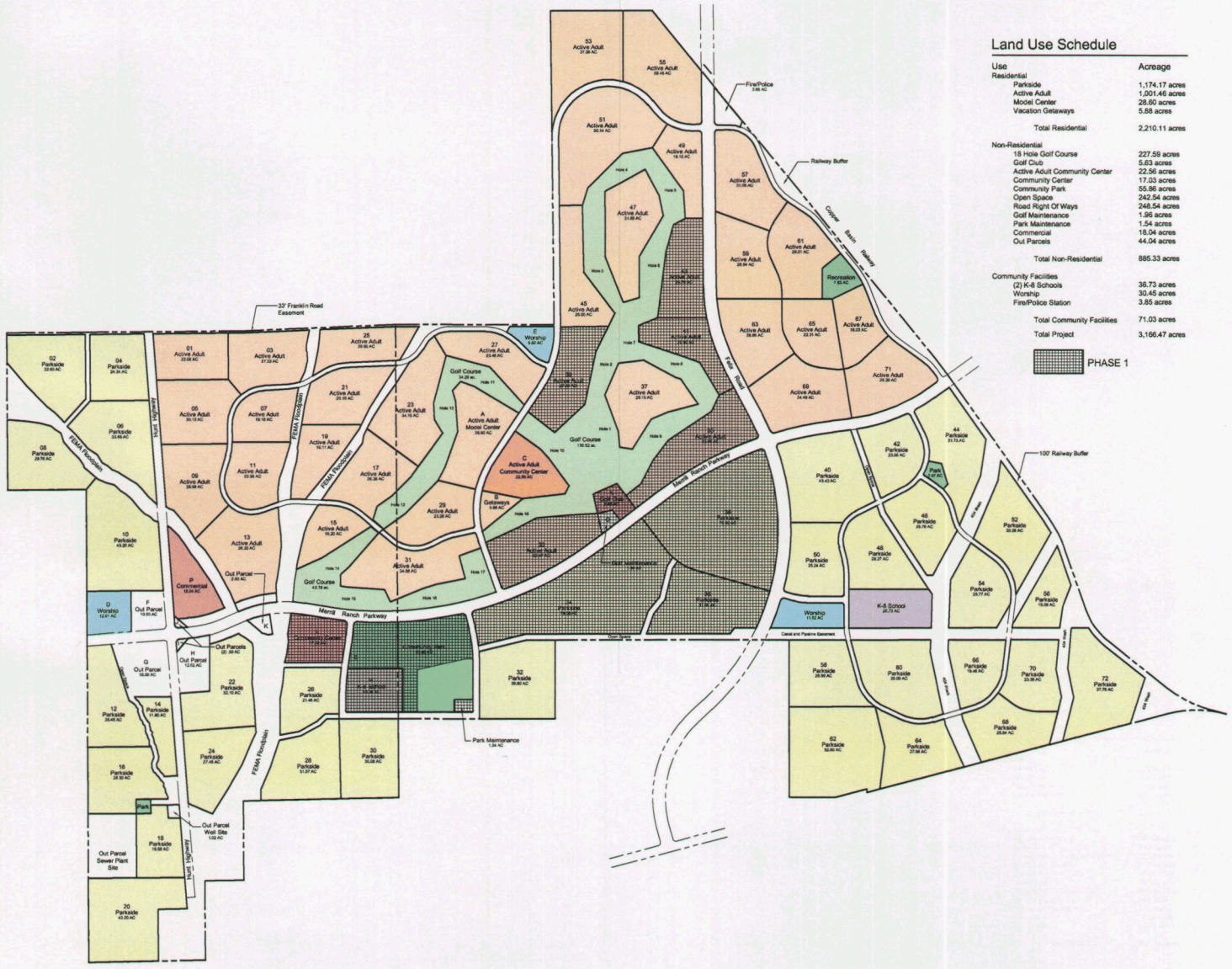
Label	Length (ft)	Section Size	Mannings n	Constructed Slope (ft/ft)	Average Velocity (ft/s)	Total Flow (gpm)	Design Capacity (gpm)	Excess Design Capacity (gpm)
P-144	1,371.00	8 inch	0.013	0.003355	1.92	133.0	314.1	181.1

Scenario: Base

Outlet Report

Label	Rim Elevation (ft)	Sump Elevation (ft)	Total Flow (gpm)	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)	Energy Grade Line In (ft)	Energy Grade Line Out (ft)
O-1	1,460.00	1,438.50	3,058.0	1,438.50	1,438.50	1,438.50	1,438.50

APPENDIX 3: SITE MASTER PLAN



Land Use Schedule

Use	Acreage
Residential	
Parkside	1,174.17 acres
Active Adult	1,001.46 acres
Model Center	28.60 acres
Vacation Getaways	5.88 acres
Total Residential	2,210.11 acres
Non-Residential	
18 Hole Golf Course	227.59 acres
Golf Club	5.83 acres
Active Adult Community Center	22.56 acres
Community Center	17.03 acres
Community Park	55.86 acres
Open Space	242.54 acres
Road Right Of Ways	248.54 acres
Golf Maintenance	1.86 acres
Park Maintenance	1.54 acres
Commercial	18.04 acres
Out Parcels	44.04 acres
Total Non-Residential	885.33 acres
Community Facilities	
(2) K-8 Schools	36.73 acres
Worship	30.45 acres
Fire/Police Station	3.85 acres
Total Community Facilities	71.03 acres
Total Project	3,166.47 acres

PHASE 1

N

0 300 600 1200 1800

SCALE: 1"=600'

JACK JOHNSON COMPANY

Designing World Destinations

In-Person - 1777 Sun Peak Drive - Park City - Utah 84098
Telephone - 435.645.9000 - Facsimile - 435.649.1820
www.jackjohnson.com

DATE:	OCTOBER 2004
DESIGNED BY:	STAFF
DRAWN BY:	STAFF
REVIEWED BY:	
PROJECT:	742.0204.07
ISSUE:	OCTOBER 19, 2004

REVISIONS

PULTE HOMES

ANTHEM

@ MERRILL RANCH

PARCEL MAP 1

JACK JOHNSON COMPANY

Designing World Destinations

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ATTACHMENT 3

MERRILL RANCH

FLORENCE, ARIZONA

MASTER WATER SYSTEM REPORT
PULTE DEVELOPMENT WEST OF FELIX ROAD

NOVEMBER 2004

Prepared For:
Pulte Homes
15333 N. Pima Road, Suite 300
Scottsdale, Arizona 85260

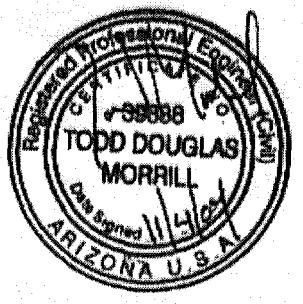
Prepared By:
Jack Johnson Company
5745 N. Scottsdale Road, Suite 130
Scottsdale, Arizona 85250

MERRILL RANCH

FLORENCE, ARIZONA

MASTER WATER SYSTEM REPORT
PULTE DEVELOPMENT WEST OF FELIX ROAD

NOVEMBER 2004



PROJECT ENGINEER

JACK JOHNSON COMPANY
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SCOTTSDALE, ARIZONA 85250

Telephone: (480) 214-0370
Facsimile: (480) 214-0356

MERRILL RANCH

FLORENCE, ARIZONA

MASTER WATER SYSTEM REPORT
PULTE DEVELOPMENT WEST OF FELIX ROAD

NOVEMBER 2004

Prepared For:
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Scottsdale, Arizona 85260

Prepared By:
Jack Johnson Company
5745 N. Scottsdale Road, Suite 130
Scottsdale, Arizona 85250

MERRILL RANCH

FLORENCE, ARIZONA

MASTER WATER SYSTEM REPORT
PULTE DEVELOPMENT WEST OF FELIX ROAD

NOVEMBER 2004

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5745 N. SCOTTSDALE ROAD, SUITE 130
SCOTTSDALE, ARIZONA 85250

Telephone: (480) 214-0370
Facsimile: (480) 214-0356

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FIGURES

Introduction

Project Location

The Pulte Development portion of Merrill Ranch West of Felix Road (the Project) lies within the jurisdiction of the Town of Florence. The Project is a 2000-acre (±) mixed-use Planned Unit Development (PUD) with low to medium-high density neighborhood housing, with several areas reserved for neighborhood businesses and commercial uses. An extensive trail network connects the lineal park system and natural desert spaces and community parks and is a part of the Open Space System. The Project is located primarily on desert scrublands, crossed by various minor drainage courses. There is a designated Federal Emergency Management Agency (FEMA) Flood Zone "A" on the western edge of Merrill Ranch. Hunt Highway runs through the property.

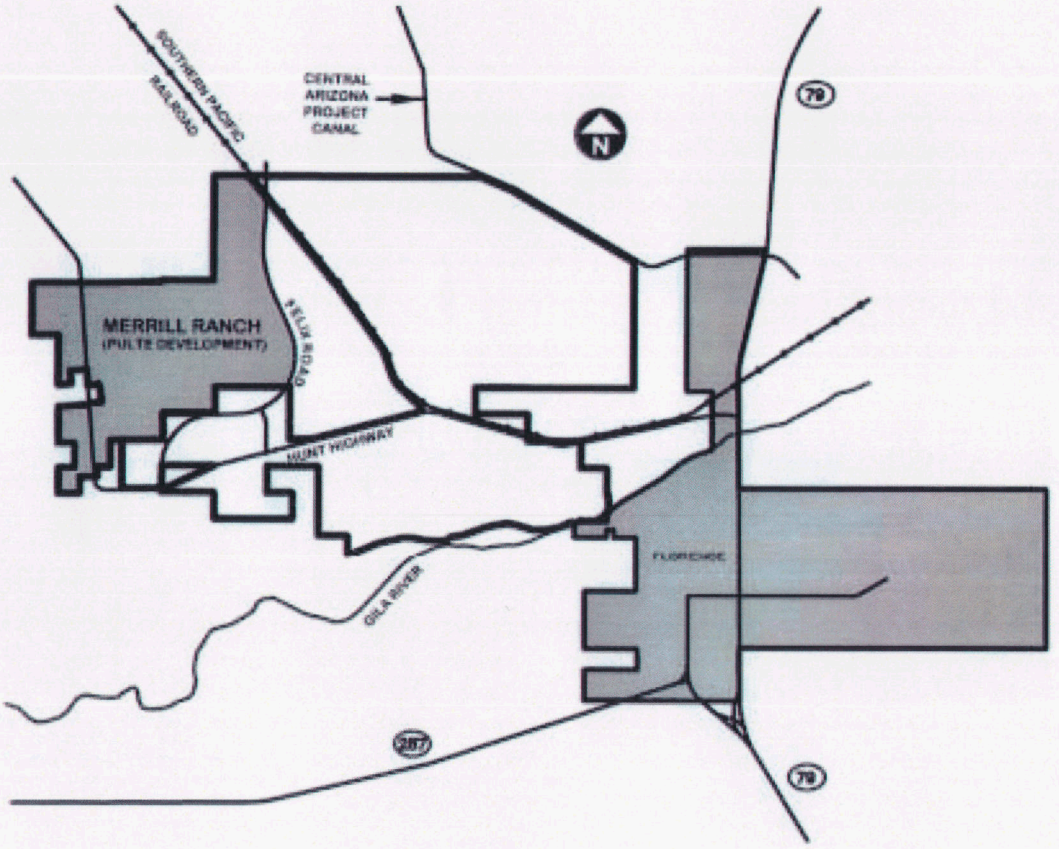


Figure 1. Project Location Map

Scope

This report presents the analysis completed for the purpose of sizing onsite water lines and estimating expected pressures and flows for the Project. The model contained herein represents the community's waterlines, i.e. lines that would participate in delivering water to the Project from offsite water lines. The water lines have been sized to deliver fire flow in addition to peak day demands. In areas of the schematic model individual water lines may have been omitted to simplify the model. Such areas share similar properties to the modeled areas and will be adequately served with a 6" line.

Peak day demands were estimated and set at various places throughout the network. The network was modeled with a fire flow at each node during peak day demands. This process was repeated for fire demands at key locations within the network. Line sizes were adjusted to maintain required flows and pressures. This process was repeated until acceptable results were obtained. This report demonstrates a network producing acceptable results according to jurisdictional criteria.

Offsite water lines and infrastructure are not part of this study. Assumptions have been made about the offsite or source system for design purposes in order to size the onsite system. These assumptions are included in the body of the report.

Jurisdictional Design Criteria

Jurisdiction

The Project lies within the jurisdictions of:

- Johnson Utilities Company
- Town of Florence, Arizona
- State of Arizona

Design Source Documents

The minimum design criteria against which the Project and all associated developments are measured, as pertaining to water systems, shall be in accordance with the following documents:

- **Johnson Utilities Company:** Johnson Utilities Company Design Guide and Standard Details, May 2003.
- **Town of Florence:** Development Codes Zoning Ordinance Subdivision Regulations, June 2000
- **Arizona State:** Engineering Bulletin No. 10 "Guidelines for the Construction of Water Systems" Arizona Department of Environmental Quality, May 1978
- **Arizona State:** Arizona Administrative Code R18-4-501

If, in any instance documents conflict, the most restrictive rule or regulation shall apply from the standpoint of capacity, level of service and public safety. The Engineer of Record shall bear the responsibility of interpretation of all such conflicts.

Water System Demands

Demand Calculations

Water demands were calculated using the methods prescribed by Johnson Utilities Company and were based on available planning and/or density estimations at the time of this report. A peaking factor of 2.0 was used to determine peak (or maximum) day demands with respect to average day demands. This same peaking factor shall be applied to each associated project/parcel for the purpose of designing the project water system.

See "Water System Demands" (Appendix 1)

Storage Volume

Water storage volume requirements were calculated using the methods prescribed by Johnson Utilities Company and were based on available planning and/or density estimations at the time of this report. Water equalization storage volume was calculated as 48% of peak day demands. Total required storage equals the sum of equalization and fire suppression storage.

See "Water System Demands" (Appendix 1)

Fire Flow

Residential and commercial fire flows were calculated based on a peak day demand plus a fire flow of 1,000 gpm for 2-hrs per Rural Metro Fire Department Requirements. Commercial & school facilities were assumed to have fire suppression sprinklers when needed to be able to utilize the available 1,000 gpm for 2-hrs. Additional fire suppression storage may otherwise need to be provided by developers for larger buildings not covered by 1,000 gpm for 2-hrs. The calculated 120,000-gallon fire suppression storage was assumed to be included within the existing system.

See "Water System Demands" (Appendix 1)

Source

Development of the source of the Project's water is not specifically this report's concern. The electronic water model contained herein includes two reservoirs set at an elevation to provide a sufficient hydraulic grade to pressurize the entire system. In the actual system, these reservoirs will be groundwater wells with storage tanks and booster pumps. They will be designed to charge the transmission water line network to the design hydraulic grade of the reservoirs in the water model.

See Appendix 2. Hydraulic Model Output Data

Pressure Zones

The Project has been designed to have a single pressure zone.

List of Design Parameters

- Well/Pump 1- Felix Road Water System - Hydraulic Grade (feet): 1625
- Well/Pump 2- Rancho Sendero Water System - Hydraulic Grade (feet): 1625
- Maximum Commercial Fire Flow = 1000 gpm
- Maximum Residential Fire Flow = 1000 gpm
- Maximum Fire Flow from any single hydrant = 1000 gpm
- Max velocity allowed during fire flow = 10 fps
- Total Fire Flow = Peak Day Demand + Needed Fire Flow
- Minimum Residual Pressure during Peak Day + Fire Flow = 20 psig
- Minimum System Pressure during Peak Day + Fire Flow = 20 psig
- Maximum System Pressure during Peak Day Flow = 80 psi
- Minimum System Pressure during Peak Day Flow = 40 psi
- Minimum System Pressure during Peak Hour Flow = 40 psi
- Hazen-Williams Roughness "C" Factor = 150 (PVC)
- Water Temperature = 68F
- Minimum Pipe Size – Local Street - Single Family Residential, 6-inch
- Water Demands (as outlined in "Water System Demands")

See "Water System Demands" (Appendix 1)

Hydraulic Model

Modeling Methodology

The software design package selected for electronic modeling is WaterCad v5.0.

The output data calculated by the electronic model is:

- Schematic Model
- Fire Flow Report (total flow needed, total flow available, minimum & residual pressures, etc.)
- Junction Report (pressures, demand outflow, etc.)
- Pipe Report (line sizes, velocities, etc.)
- Reservoir Report (inflow, HG, etc.)

See Appendix 2. Hydraulic Model Output Data

Conclusions

The data supplied by the model demonstrates that the designed system design represents an adequately sized system for the assumptions as listed herein.

APPENDIX 1: WATER SYSTEM DEMANDS

MERRILL RANCH - PULTE DEVELOPMENT WEST OF FELIX ROAD
WATER SYSTEM DEMANDS
10/19/2004

Water Systen Demands													Equalization Storage
Parcel	D. U.	Pop	Residential			Commercial				Total			
			Ave. Day	Peak Day		Average Day		Peak Day		Ave. Day	Peak Day		Gallons
	#	pers	gpd	gpd	gpm	acre	gpd	gpd	gpm	gpd	gpd	gpm	(48% Peak Day)
1	86	155	15,500	31,000	22	0	0	0	0	15,500	31,000	22	14,880
2	137	356	35,599	71,198	49	0	0	0	0	35,599	71,198	49	34,175
3	106	191	19,115	38,231	27	0	0	0	0	19,115	38,231	27	18,351
4	102	266	26,579	53,159	37	0	0	0	0	26,579	53,159	37	25,516
5	118	212	21,151	42,303	29	0	0	0	0	21,151	42,303	29	20,305
6	141	368	36,779	73,557	51	0	0	0	0	36,779	73,557	51	35,307
7	75	135	13,464	26,929	19	0	0	0	0	13,464	26,929	19	12,926
8	125	325	32,498	64,996	45	0	0	0	0	32,498	64,996	45	31,198
9	117	210	21,046	42,092	29	0	0	0	0	21,046	42,092	29	20,204
10	190	494	49,358	98,717	69	0	0	0	0	49,358	98,717	69	47,384
11	88	158	15,830	31,660	22	0	0	0	0	15,830	31,660	22	15,197
12	119	311	31,067	62,135	43	0	0	0	0	31,067	62,135	43	29,825
13	142	255	25,483	50,965	35	0	0	0	0	25,483	50,965	35	24,463
14	50	129	12,886	25,771	18	0	0	0	0	12,886	25,771	18	12,370
15	63	114	11,372	22,745	16	0	0	0	0	11,372	22,745	16	10,918
16	119	309	30,904	61,807	43	0	0	0	0	30,904	61,807	43	29,667
17	103	185	18,505	37,009	26	0	0	0	0	18,505	37,009	26	17,765
18	82	214	21,392	42,785	30	0	0	0	0	21,392	42,785	30	20,537
19	75	134	13,415	26,830	19	0	0	0	0	13,415	26,830	19	12,879
20	181	472	47,174	94,349	66	0	0	0	0	47,174	94,349	66	45,287
21	98	177	17,662	35,325	25	0	0	0	0	17,662	35,325	25	16,956
22	135	351	35,053	70,106	49	0	0	0	0	35,053	70,106	49	33,651
23	133	240	23,973	47,947	33	0	0	0	0	23,973	47,947	33	23,014
24	115	300	30,008	60,016	42	0	0	0	0	30,008	60,016	42	28,808
25	82	147	14,672	29,344	20	0	0	0	0	14,672	29,344	20	14,085
26	90	235	23,456	46,912	33	0	0	0	0	23,456	46,912	33	22,518
27	91	165	16,469	32,938	23	0	0	0	0	16,469	32,938	23	15,810
28	133	345	34,474	68,949	48	0	0	0	0	34,474	68,949	48	33,095
29	91	163	16,343	32,685	23	0	0	0	0	16,343	32,685	23	15,689
30	126	328	32,847	65,695	46	0	0	0	0	32,847	65,695	46	31,533
31	135	243	24,275	48,550	34	0	0	0	0	24,275	48,550	34	23,304

MERRILL RANCH - PULTE DEVELOPMENT WEST OF FELIX ROAD
WATER SYSTEM DEMANDS
10/19/2004

Water Systen Demands													Equalization Storage
Parcel	D. U.	Pop	Residential			Commercial				Total			
			Ave. Day	Peak Day		Average Day		Peak Day		Ave. Day	Peak Day		Gallons (48% Peak Day)
	#	pers	gpd	gpd	gpm	acre	gpd	gpd	gpm	gpd	gpd	gpm	
32	155	402	40,186	80,371	56	0	0	0	0	40,186	80,371	56	38,578
33	127	228	22,794	45,588	32	0	0	0	0	22,794	45,588	32	21,882
34	334	869	86,901	173,803	121	0	0	0	0	86,901	173,803	121	83,425
35	129	232	23,166	46,332	32	0	0	0	0	23,166	46,332	32	22,239
36	158	411	41,125	82,249	57	0	0	0	0	41,125	82,249	57	39,480
37	114	205	20,463	40,927	28	0	0	0	0	20,463	40,927	28	19,645
38	333	866	86,628	173,257	120	0	0	0	0	86,628	173,257	120	83,163
39	105	190	18,989	37,978	26	0	0	0	0	18,989	37,978	26	18,230
41	80	145	14,461	28,922	20	0	0	0	0	14,461	28,922	20	13,883
43	96	173	17,339	34,679	24	0	0	0	0	17,339	34,679	24	16,646
45	98	176	17,550	35,100	24	0	0	0	0	17,550	35,100	24	16,848
47	124	224	22,380	44,760	31	0	0	0	0	22,380	44,760	31	21,485
49	71	127	12,706	25,412	18	0	0	0	0	12,706	25,412	18	12,198
51	196	352	35,198	70,397	49	0	0	0	0	35,198	70,397	49	33,790
53	145	260	26,030	52,060	36	0	0	0	0	26,030	52,060	36	24,989
55	154	277	27,701	55,402	38	0	0	0	0	27,701	55,402	38	26,593
A	120	312	21,622	43,243	30	0	0	0	0	21,622	43,243	30	20,757
B	25	64	4,445	8,891	6	0	0	0	0	4,445	8,891	6	4,267

MERRILL RANCH - PULTE DEVELOPMENT WEST OF FELIX ROAD
WATER SYSTEM DEMANDS
10/19/2004

Water Systen Demands													Equalization Storage
Parcel	D. U.	Pop	Residential			Commercial				Total			
			Ave. Day	Peak Day		Average Day		Peak Day		Ave. Day	Peak Day		Gallons (48% Peak Day)
	#	pers	gpd	gpd	gpm	acre	gpd	gpd	gpm	gpd	gpd	gpm	
C	0	0	0	0	0	22.56	33,840	67,680	47	33,840	67,680	47	32,486
D	0	0	0	0	0	12.01	18,015	36,030	25	18,015	36,030	25	17,294
E	0	0	0	0	0	6.92	10,380	20,760	14	10,380	20,760	14	9,965
F	0	0	0	0	0	10	15,000	30,000	21	15,000	30,000	21	14,400
G	0	0	0	0	0	18	27,000	54,000	38	27,000	54,000	38	25,920
H	0	0	0	0	0	12.02	18,030	36,060	25	18,030	36,060	25	17,309
I	0	0	0	0	0	0.5	750	1,500	1	750	1,500	1	720
J	0	0	0	0	0	0.5	750	1,500	1	750	1,500	1	720
K	0	0	0	0	0	2	3,000	6,000	4	3,000	6,000	4	2,880
L	0	0	0	0	0	17.03	25,545	51,090	35	25,545	51,090	35	24,523
M	0	0	0	0	0	55.86	83,790	167,580	116	83,790	167,580	116	80,438
N	0	0	0	0	0	1.54	2,310	4,620	3	2,310	4,620	3	2,218
O	0	0	0	0	0	16	24,000	48,000	33	24,000	48,000	33	23,040
P	0	0	0	0	0	5.63	8,445	16,890	12	8,445	16,890	12	8,107
Q	0	0	0	0	0	1.96	2,940	5,880	4	2,940	5,880	4	2,822
R	0	0	0	0	0	18.04	27,060	54,120	38	27,060	54,120	38	25,978
Totals	**6,011**	**13,196**	**1,308,037**	**2,616,075**	**1,817**	**201**	**300,855**	**601,710**	**418**	**1,608,892**	**3,217,785**	**2,235**	**1,544,537**
										Fire Suppression Storage (gal):			**120,000**
										Total Storage (gal):			**1,664,537**

Water System Design Criteria:

100	gpd per person (residentail areas requiring sewers)
2.6	persons/D.U. (all Family Community Residences)
1.8	persons/D.U. (all Active Adult Community Residences)
1,500	gpd per acre (all commercial and school areas)
2.0	peak day factor (average day multiplier)

Note that all calculations are based on "Johnson Utilities Company Design Guide and Standard Details" May 2003.

APPENDIX 2: HYDRAULIC MODEL OUTPUT DATA

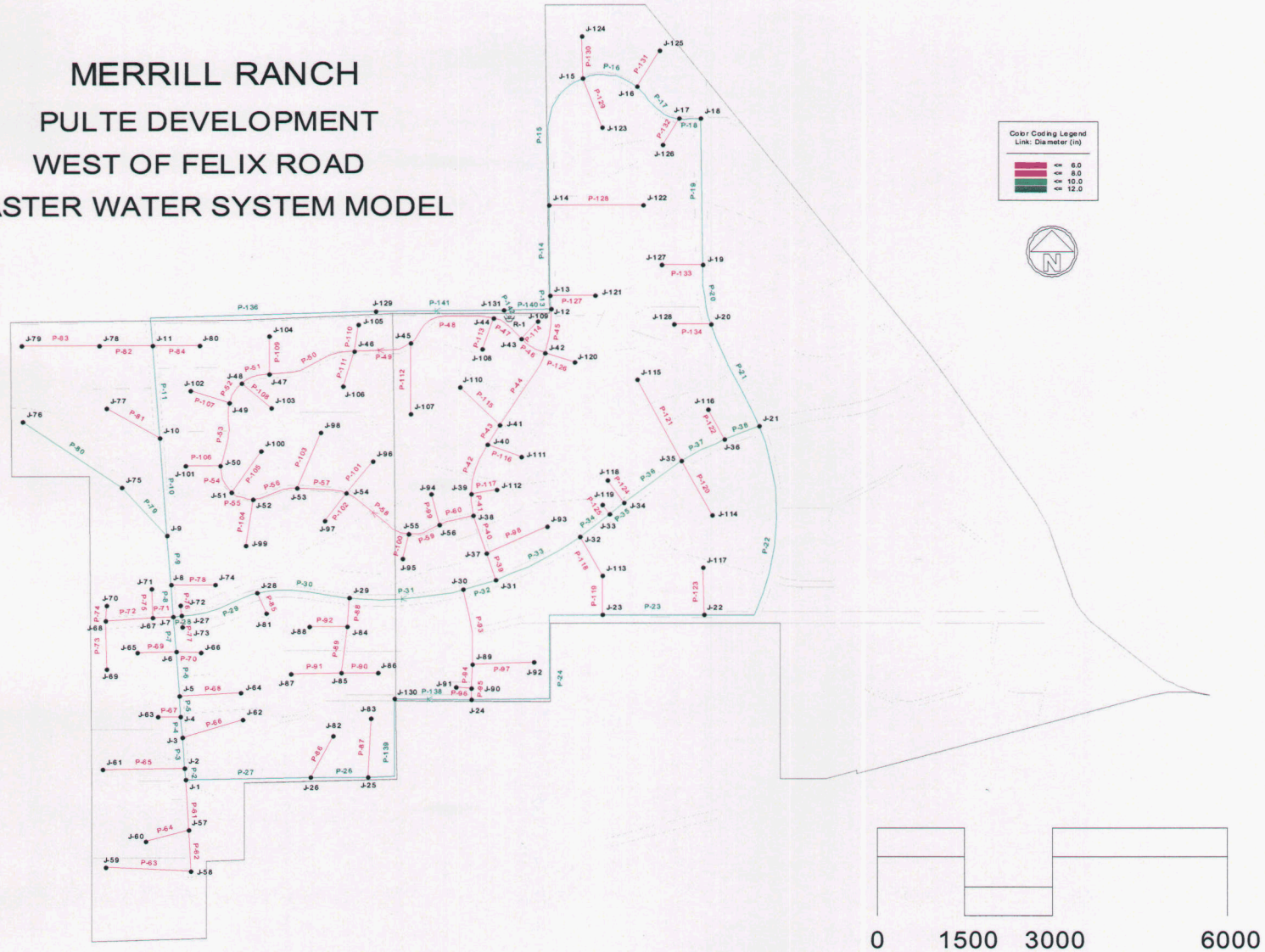
Scenario: Base

MERRILL RANCH

PULTE DEVELOPMENT

WEST OF FELIX ROAD

MASTER WATER SYSTEM MODEL



Title: ANTHEM @ MERRILL RANCH
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Jack Johnson Company
 37 Brookside Road Waterbury, CT 06708 USA +1-203-755-1666

Project Engineer: Seth Wallace
WaterCAD v5.0 [5.0037]

Scenario: Base
Fire Flow Analysis
Fire Flow Report

Label	Needed Fire Flow (gpm)	Total Flow Needed (gpm)	Total Flow Available (gpm)	Residual Pressure (psi)	Calculated Residual Pressure (psi)	Minimum System Pressure (psi)	Calculated Minimum System Pressure (psi)	Minimum System Junction	Fire Flow Balanced?	Satisfies Fire Flow Constraints?
J-1	1,000	1,000	2,645	20.00	34.10	20.00	20.00	J-76	true	true
J-2	1,000	1,000	2,638	20.00	32.27	20.00	20.00	J-76	true	true
J-3	1,000	1,000	2,619	20.00	33.22	20.00	20.00	J-76	true	true
J-4	1,000	1,000	2,605	20.00	31.83	20.00	20.00	J-76	true	true
J-5	1,000	1,000	2,591	20.00	30.45	20.00	20.00	J-76	true	true
J-6	1,000	1,000	2,554	20.00	32.47	20.00	20.00	J-76	true	true
J-7	1,000	1,000	2,519	20.00	31.80	20.00	20.00	J-76	true	true
J-8	1,000	1,000	2,469	20.00	31.20	20.00	20.00	J-76	true	true
J-9	1,000	1,000	2,393	20.00	33.03	20.00	20.00	J-76	true	true
J-10	1,000	1,000	2,581	20.00	28.18	20.00	20.00	J-76	true	true
J-11	1,000	1,000	2,749	20.00	28.74	20.00	20.00	J-79	true	true
J-12	1,000	1,000	5,000	20.00	28.85	20.00	20.43	J-21	true	true
J-13	1,000	1,000	4,644	20.00	27.50	20.00	20.00	J-18	true	true
J-14	1,000	1,000	3,173	20.00	26.56	20.00	20.00	J-18	true	true
J-15	1,000	1,000	2,355	20.00	24.32	20.00	20.00	J-18	true	true
J-16	1,000	1,000	2,181	20.00	24.31	20.00	20.00	J-18	true	true
J-17	1,000	1,000	2,053	20.00	22.16	20.00	20.00	J-18	true	true
J-18	1,000	1,000	2,008	20.00	20.00	20.00	20.99	J-21	true	true
J-19	1,000	1,000	1,830	20.00	21.18	20.00	20.00	J-21	true	true
J-20	1,000	1,000	1,757	20.00	21.21	20.00	20.00	J-21	true	true
J-21	1,000	1,000	1,645	20.00	20.00	20.00	21.30	J-116	true	true
J-22	1,000	1,000	1,663	20.00	22.19	20.00	20.00	J-117	true	true
J-23	1,000	1,000	1,681	20.00	25.90	20.00	20.00	J-21	true	true
J-24	1,000	1,000	1,693	20.00	24.93	20.00	20.00	J-21	true	true
J-25	1,000	1,000	2,630	20.00	27.13	20.00	20.00	J-21	true	true
J-26	1,000	1,000	2,649	20.00	26.63	20.00	20.00	J-21	true	true
J-27	1,000	1,000	2,535	20.00	30.81	20.00	20.00	J-76	true	true
J-28	1,000	1,000	2,641	20.00	28.23	20.00	20.00	J-76	true	true
J-29	1,000	1,000	2,667	20.00	27.39	20.00	20.00	J-115	true	true
J-30	1,000	1,000	1,718	20.00	25.18	20.00	20.00	J-115	true	true
J-31	1,000	1,000	1,724	20.00	25.72	20.00	20.00	J-115	true	true
J-32	1,000	1,000	1,667	20.00	22.56	20.00	20.00	J-115	true	true
J-33	1,000	1,000	1,637	20.00	22.71	20.00	20.00	J-115	true	true
J-34	1,000	1,000	1,622	20.00	22.90	20.00	20.00	J-115	true	true
J-35	1,000	1,000	1,568	20.00	26.07	20.00	20.00	J-115	true	true
J-36	1,000	1,000	1,619	20.00	20.44	20.00	20.00	J-116	true	true
J-37	1,000	1,000	1,795	20.00	22.62	20.00	20.00	J-115	true	true
J-38	1,000	1,000	1,909	20.00	21.80	20.00	20.00	J-115	true	true
J-39	1,000	1,000	1,912	20.00	22.16	20.00	20.00	J-112	true	true
J-40	1,000	1,000	1,916	20.00	22.17	20.00	20.00	J-111	true	true
J-41	1,000	1,000	2,032	20.00	21.03	20.00	20.00	J-111	true	true
J-42	1,000	1,000	2,600	20.00	20.03	20.00	20.00	J-109	true	true
J-43	1,000	1,000	1,954	20.00	20.00	20.00	20.00	J-109	true	true
J-44	1,000	1,000	1,706	20.00	20.00	20.00	20.00	J-108	true	true
J-45	1,000	1,000	1,299	20.00	20.01	20.00	20.00	J-107	true	true
J-46	1,000	1,000	1,530	20.00	20.00	20.00	20.00	J-106	true	true
J-47	1,000	1,000	1,386	20.00	24.47	20.00	20.00	J-102	true	true
J-48	1,000	1,000	1,345	20.00	23.41	20.00	20.00	J-102	true	true
J-49	1,000	1,000	1,315	20.00	24.33	20.00	20.00	J-102	true	true
J-50	1,000	1,000	1,396	20.00	21.18	20.00	20.00	J-102	true	true
J-51	1,000	1,000	1,436	20.00	20.00	20.00	20.09	J-102	true	true
J-52	1,000	1,000	1,474	20.00	23.35	20.00	20.00	J-51	true	true

Scenario: Base
Fire Flow Analysis
Fire Flow Report

Label	Needed Fire Flow (gpm)	Total Flow Needed (gpm)	Total Flow Available (gpm)	Residual Pressure (psi)	Calculated Residual Pressure (psi)	Minimum System Pressure (psi)	Calculated Minimum System Pressure (psi)	Minimum System Junction	Fire Flow Balanced?	Satisfies Fire Flow Constraints?
J-53	1,000	1,000	1,555	20.00	21.89	20.00	20.00	J-102	true	true
J-54	1,000	1,000	1,625	20.00	22.17	20.00	20.00	J-96	true	true
J-55	1,000	1,000	1,469	20.00	20.01	20.00	20.00	J-95	true	true
J-56	1,000	1,000	1,673	20.00	20.01	20.00	20.00	J-95	true	true
J-57	1,000	1,000	2,078	20.00	22.17	20.00	20.00	J-60	true	true
J-58	1,000	1,000	1,756	20.00	22.22	20.00	20.00	J-59	true	true
J-59	1,000	1,066	1,408	20.00	20.00	20.00	33.82	J-21	true	true
J-60	1,000	1,030	1,723	20.00	20.00	20.00	30.66	J-21	true	true
J-61	1,000	1,043	1,729	20.00	20.00	20.00	30.76	J-21	true	true
J-62	1,000	1,042	2,014	20.00	20.00	20.00	27.90	J-76	true	true
J-63	1,000	1,018	2,462	20.00	20.00	20.00	22.08	J-76	true	true
J-64	1,000	1,049	2,047	20.00	20.00	20.00	27.38	J-76	true	true
J-65	1,000	1,038	2,242	20.00	20.00	20.00	24.54	J-76	true	true
J-66	1,000	1,025	2,492	20.00	20.00	20.00	21.17	J-76	true	true
J-67	1,000	1,000	2,406	20.00	20.04	20.00	20.00	J-70	true	true
J-68	1,000	1,000	1,730	20.00	20.00	20.00	20.00	J-70	true	true
J-69	1,000	1,043	1,511	20.00	20.00	20.00	28.46	J-70	true	true
J-70	1,000	1,025	1,637	20.00	20.00	20.00	23.94	J-68	true	true
J-71	1,000	1,021	1,963	20.00	20.00	20.00	27.41	J-76	true	true
J-72	1,000	1,001	2,536	20.00	24.93	20.00	20.00	J-76	true	true
J-73	1,000	1,001	2,536	20.00	24.72	20.00	20.00	J-76	true	true
J-74	1,000	1,047	2,134	20.00	20.00	20.00	25.12	J-76	true	true
J-75	1,000	1,069	1,888	20.00	28.67	20.00	20.00	J-76	true	true
J-76	1,000	1,045	1,427	20.00	20.00	20.00	34.46	J-21	true	true
J-77	1,000	1,051	1,658	20.00	20.00	20.00	31.72	J-76	true	true
J-78	1,000	1,037	1,594	20.00	24.36	20.00	20.00	J-79	true	true
J-79	1,000	1,049	1,145	20.00	20.00	20.00	34.79	J-78	true	true
J-80	1,000	1,022	2,029	20.00	20.00	20.00	29.11	J-79	true	true
J-81	1,000	1,004	2,473	20.00	20.00	20.00	22.18	J-76	true	true
J-82	1,000	1,048	2,042	20.00	20.00	20.00	27.35	J-21	true	true
J-83	1,000	1,046	1,923	20.00	20.00	20.00	28.43	J-21	true	true
J-84	1,000	1,000	2,131	20.00	24.36	20.00	20.00	J-86	true	true
J-85	1,000	1,000	1,646	20.00	22.17	20.00	20.00	J-86	true	true
J-86	1,000	1,033	1,468	20.00	20.00	20.00	29.90	J-85	true	true
J-87	1,000	1,033	1,545	20.00	20.00	20.00	24.99	J-86	true	true
J-88	1,000	1,035	1,870	20.00	20.00	20.00	28.12	J-86	true	true
J-89	1,000	1,000	1,701	20.00	23.31	20.00	20.00	J-21	true	true
J-90	1,000	1,000	1,696	20.00	24.22	20.00	20.00	J-21	true	true
J-91	1,000	1,003	1,698	20.00	20.00	20.00	20.03	J-21	true	true
J-92	1,000	1,056	1,377	20.00	20.00	20.00	27.32	J-21	true	true
J-93	1,000	1,032	1,334	20.00	20.00	20.00	28.90	J-21	true	true
J-94	1,000	1,023	1,498	20.00	20.00	20.00	26.93	J-95	true	true
J-95	1,000	1,034	1,388	20.00	20.00	20.00	24.73	J-55	true	true
J-96	1,000	1,026	1,426	20.00	20.00	20.00	27.54	J-102	true	true
J-97	1,000	1,016	1,494	20.00	20.00	20.00	25.39	J-102	true	true
J-98	1,000	1,019	1,339	20.00	20.00	20.00	27.25	J-102	true	true
J-99	1,000	1,035	1,372	20.00	20.00	20.00	24.61	J-102	true	true
J-100	1,000	1,022	1,341	20.00	20.00	20.00	24.14	J-102	true	true
J-101	1,000	1,029	1,304	20.00	20.00	20.00	24.32	J-102	true	true
J-102	1,000	1,029	1,189	20.00	20.00	20.00	30.20	J-49	true	true
J-103	1,000	1,019	1,287	20.00	20.00	20.00	22.88	J-102	true	true
J-104	1,000	1,027	1,308	20.00	20.00	20.00	23.80	J-102	true	true

Scenario: Base
Fire Flow Analysis
Fire Flow Report

Label	Needed Fire Flow (gpm)	Total Flow Needed (gpm)	Total Flow Available (gpm)	Residual Pressure (psi)	Calculated Residual Pressure (psi)	Minimum System Pressure (psi)	Calculated Minimum System Pressure (psi)	Minimum System Junction	Fire Flow Balanced?	Satisfies Fire Flow Constraints?
J-105	1,000	1,020	1,410	20.00	20.00	20.00	24.69	J-102	true	true
J-106	1,000	1,025	1,372	20.00	20.00	20.00	26.02	J-102	true	true
J-107	1,000	1,033	1,138	20.00	20.00	20.00	29.29	J-45	true	true
J-108	1,000	1,023	1,501	20.00	20.00	20.00	27.17	J-44	true	true
J-109	1,000	1,014	1,689	20.00	20.00	20.00	26.58	J-43	true	true
J-110	1,000	1,030	1,550	20.00	20.00	20.00	30.27	J-21	true	true
J-111	1,000	1,030	1,583	20.00	20.00	20.00	28.94	J-21	true	true
J-112	1,000	1,006	1,661	20.00	20.00	20.00	25.44	J-21	true	true
J-113	1,000	1,121	1,811	20.00	23.69	20.00	20.00	J-115	true	true
J-114	1,000	1,120	1,308	20.00	20.00	20.00	28.38	J-115	true	true
J-115	1,000	1,028	1,078	20.00	20.00	20.00	31.58	J-21	true	true
J-116	1,000	1,032	1,364	20.00	20.00	20.00	26.43	J-115	true	true
J-117	1,000	1,057	1,351	20.00	20.00	20.00	27.40	J-21	true	true
J-118	1,000	1,012	1,497	20.00	20.00	20.00	23.05	J-115	true	true
J-119	1,000	1,004	1,641	20.00	20.54	20.00	20.00	J-115	true	true
J-120	1,000	1,026	1,950	20.00	20.00	20.00	30.05	J-21	true	true
J-121	1,000	1,024	2,290	20.00	20.00	20.00	35.83	J-18	true	true
J-122	1,000	1,031	1,451	20.00	20.00	20.00	36.72	J-18	true	true
J-123	1,000	1,049	1,683	20.00	20.00	20.00	29.98	J-18	true	true
J-124	1,000	1,036	1,792	20.00	20.00	20.00	28.45	J-18	true	true
J-125	1,000	1,038	1,638	20.00	20.00	20.00	28.71	J-18	true	true
J-126	1,000	1,018	1,682	20.00	20.00	20.00	26.31	J-18	true	true
J-127	1,000	1,024	1,458	20.00	20.00	20.00	27.18	J-21	true	true
J-128	1,000	1,020	1,449	20.00	20.00	20.00	26.24	J-21	true	true
J-129	1,000	1,000	4,431	20.00	30.45	20.00	20.00	J-79	true	true
J-130	1,000	1,000	2,598	20.00	24.60	20.00	20.00	J-21	true	true
J-131	1,000	1,000	5,000	20.00	48.45	20.00	38.05	J-21	true	true

Scenario: Base
Steady State Analysis
Junction Report

Label	Elevation (ft)	Type	Base Flow (gpm)	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure Head (ft)	Pressure (psi)
J-1	1,455.00	Demand	0	0	1,611.77	156.77	67.83
J-2	1,460.00	Demand	0	0	1,611.77	151.77	65.66
J-3	1,460.00	Demand	0	0	1,611.79	151.79	65.67
J-4	1,465.00	Demand	0	0	1,611.82	146.82	63.52
J-5	1,470.00	Demand	0	0	1,611.85	141.85	61.37
J-6	1,470.00	Demand	0	0	1,611.95	141.95	61.41
J-7	1,476.00	Demand	0	0	1,612.07	136.07	58.87
J-8	1,480.00	Demand	0	0	1,612.32	132.32	57.25
J-9	1,480.00	Demand	0	0	1,612.79	132.79	57.45
J-10	1,490.00	Demand	0	0	1,614.13	124.13	53.71
J-11	1,490.00	Demand	0	0	1,615.60	125.60	54.34
J-12	1,500.00	Demand	0	0	1,620.99	120.99	52.35
J-13	1,500.00	Demand	0	0	1,620.76	120.76	52.25
J-14	1,500.00	Demand	0	0	1,619.24	119.24	51.59
J-15	1,505.00	Demand	0	0	1,617.03	112.03	48.47
J-16	1,505.00	Demand	0	0	1,616.34	111.34	48.17
J-17	1,510.00	Demand	0	0	1,615.76	105.76	45.76
J-18	1,515.00	Demand	0	0	1,615.54	100.54	43.50
J-19	1,510.00	Demand	0	0	1,614.10	104.10	45.04
J-20	1,510.00	Demand	0	0	1,613.55	103.55	44.80
J-21	1,513.00	Demand	0	0	1,612.59	99.59	43.09
J-22	1,500.00	Demand	0	0	1,612.10	112.10	48.50
J-23	1,490.00	Demand	0	0	1,611.99	121.99	52.78
J-24	1,485.00	Demand	0	0	1,611.88	126.88	54.89
J-25	1,470.00	Demand	0	0	1,611.78	141.78	61.34
J-26	1,470.00	Demand	0	0	1,611.77	141.77	61.34
J-27	1,476.00	Demand	0	0	1,612.07	136.07	58.87
J-28	1,467.00	Demand	0	0	1,612.02	145.02	62.74
J-29	1,465.00	Demand	0	0	1,611.96	146.96	63.58
J-30	1,488.00	Demand	0	0	1,611.98	123.98	53.64
J-31	1,490.00	Demand	0	0	1,612.01	122.01	52.79
J-32	1,500.00	Demand	0	0	1,612.01	112.01	48.46
J-33	1,500.00	Demand	0	0	1,612.03	112.03	48.47
J-34	1,500.00	Demand	0	0	1,612.04	112.04	48.48
J-35	1,496.00	Demand	0	0	1,612.09	116.09	50.23
J-36	1,509.00	Demand	0	0	1,612.34	103.34	44.71
J-37	1,491.00	Demand	0	0	1,612.10	121.10	52.40
J-38	1,485.00	Demand	0	0	1,612.32	127.32	55.09
J-39	1,485.00	Demand	0	0	1,612.72	127.72	55.26
J-40	1,490.00	Demand	0	0	1,613.72	123.72	53.53
J-41	1,490.00	Demand	0	0	1,614.27	124.27	53.77
J-42	1,500.00	Demand	0	0	1,616.66	116.66	50.47
J-43	1,500.00	Demand	0	0	1,616.05	116.05	50.21
J-44	1,490.00	Demand	0	0	1,615.37	125.37	54.24
J-45	1,480.00	Demand	0	0	1,613.81	133.81	57.89
J-46	1,480.00	Demand	0	0	1,613.09	133.09	57.58
J-47	1,475.00	Demand	0	0	1,612.38	137.38	59.44
J-48	1,480.00	Demand	0	0	1,612.21	132.21	57.20
J-49	1,480.00	Demand	0	0	1,612.12	132.12	57.16
J-50	1,480.00	Demand	0	0	1,611.96	131.96	57.09
J-51	1,480.00	Demand	0	0	1,611.93	131.93	57.08
J-52	1,470.00	Demand	0	0	1,611.92	141.92	61.40
J-53	1,470.00	Demand	0	0	1,611.92	141.92	61.40
J-54	1,470.00	Demand	0	0	1,611.93	141.93	61.41

Scenario: Base
Steady State Analysis
Junction Report

Label	Elevation (ft)	Type	Base Flow (gpm)	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure Head (ft)	Pressure (psi)
J-55	1,480.00	Demand	0	0	1,612.04	132.04	57.13
J-56	1,480.00	Demand	0	0	1,612.15	132.15	57.17
J-57	1,455.00	Demand	0	0	1,611.61	156.61	67.76
J-58	1,450.00	Demand	0	0	1,611.55	161.55	69.89
J-59	1,455.00	Demand	66	66	1,611.41	156.41	67.67
J-60	1,460.00	Demand	30	30	1,611.59	151.59	65.59
J-61	1,470.00	Demand	43	43	1,611.71	141.71	61.31
J-62	1,460.00	Demand	42	42	1,611.75	151.75	65.65
J-63	1,470.00	Demand	18	18	1,611.81	141.81	61.36
J-64	1,460.00	Demand	49	49	1,611.79	151.79	65.67
J-65	1,470.00	Demand	38	38	1,611.93	141.93	61.40
J-66	1,470.00	Demand	25	25	1,611.94	141.94	61.41
J-67	1,480.00	Demand	0	0	1,612.01	132.01	57.12
J-68	1,480.00	Demand	0	0	1,611.94	131.94	57.08
J-69	1,475.00	Demand	43	43	1,611.90	136.90	59.23
J-70	1,480.00	Demand	25	25	1,611.93	131.93	57.08
J-71	1,480.00	Demand	21	21	1,612.01	132.01	57.11
J-72	1,476.00	Demand	1	1	1,612.07	136.07	58.87
J-73	1,475.00	Demand	1	1	1,612.07	137.07	59.30
J-74	1,475.00	Demand	47	47	1,612.29	137.29	59.40
J-75	1,490.00	Demand	69	69	1,612.69	122.69	53.08
J-76	1,510.00	Demand	45	45	1,612.66	102.66	44.42
J-77	1,500.00	Demand	51	51	1,614.07	114.07	49.35
J-78	1,500.00	Demand	37	37	1,615.46	115.46	49.95
J-79	1,510.00	Demand	49	49	1,615.39	105.39	45.60
J-80	1,490.00	Demand	22	22	1,615.59	125.59	54.34
J-81	1,465.00	Demand	4	4	1,612.02	147.02	63.61
J-82	1,470.00	Demand	48	48	1,611.73	141.73	61.32
J-83	1,470.00	Demand	46	46	1,611.73	141.73	61.32
J-84	1,465.00	Demand	0	0	1,611.86	146.86	63.54
J-85	1,470.00	Demand	0	0	1,611.79	141.79	61.35
J-86	1,475.00	Demand	33	33	1,611.78	136.78	59.18
J-87	1,460.00	Demand	33	33	1,611.77	151.77	65.66
J-88	1,465.00	Demand	35	35	1,611.85	146.85	63.53
J-89	1,485.00	Demand	0	0	1,611.88	126.88	54.89
J-90	1,485.00	Demand	0	0	1,611.88	126.88	54.89
J-91	1,485.00	Demand	3	3	1,611.88	126.88	54.89
J-92	1,490.00	Demand	56	56	1,611.81	121.81	52.70
J-93	1,497.00	Demand	32	32	1,612.08	115.08	49.79
J-94	1,480.00	Demand	23	23	1,612.14	132.14	57.17
J-95	1,480.00	Demand	34	34	1,612.03	132.03	57.12
J-96	1,475.00	Demand	26	26	1,611.92	136.92	59.24
J-97	1,470.00	Demand	16	16	1,611.93	141.93	61.41
J-98	1,470.00	Demand	19	19	1,611.91	141.91	61.40
J-99	1,470.00	Demand	35	35	1,611.90	141.90	61.39
J-100	1,470.00	Demand	22	22	1,611.92	141.92	61.40
J-101	1,480.00	Demand	29	29	1,611.95	131.95	57.09
J-102	1,490.00	Demand	29	29	1,612.10	122.10	52.83
J-103	1,480.00	Demand	19	19	1,612.21	132.21	57.20
J-104	1,480.00	Demand	27	27	1,612.37	132.37	57.27
J-105	1,480.00	Demand	20	20	1,613.09	133.09	57.58
J-106	1,480.00	Demand	25	25	1,613.08	133.08	57.58
J-107	1,480.00	Demand	33	33	1,613.78	133.78	57.88
J-108	1,490.00	Demand	23	23	1,615.37	125.37	54.24

Scenario: Base
Steady State Analysis
Junction Report

Label	Elevation (ft)	Type	Base Flow (gpm)	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure Head (ft)	Pressure (psi)
J-109	1,500.00	Demand	14	14	1,616.05	116.05	50.21
J-110	1,490.00	Demand	30	30	1,614.25	124.25	53.76
J-111	1,495.00	Demand	30	30	1,613.70	118.70	51.36
J-112	1,490.00	Demand	6	6	1,612.72	122.72	53.10
J-113	1,490.00	Demand	121	121	1,611.94	121.94	52.76
J-114	1,505.00	Demand	120	120	1,611.80	106.80	46.21
J-115	1,510.00	Demand	28	28	1,612.06	102.06	44.16
J-116	1,510.00	Demand	32	32	1,612.33	102.33	44.27
J-117	1,505.00	Demand	57	57	1,612.05	107.05	46.31
J-118	1,500.00	Demand	12	12	1,612.04	112.04	48.47
J-119	1,498.00	Demand	4	4	1,612.03	114.03	49.34
J-120	1,500.00	Demand	26	26	1,616.65	116.65	50.47
J-121	1,505.00	Demand	24	24	1,620.75	115.75	50.08
J-122	1,510.00	Demand	31	31	1,619.20	109.20	47.25
J-123	1,505.00	Demand	49	49	1,616.98	111.98	48.45
J-124	1,505.00	Demand	36	36	1,617.01	112.01	48.46
J-125	1,510.00	Demand	38	38	1,616.32	106.32	46.00
J-126	1,510.00	Demand	18	18	1,615.76	105.76	45.76
J-127	1,510.00	Demand	24	24	1,614.09	104.09	45.03
J-128	1,510.00	Demand	20	20	1,613.54	103.54	44.80
J-129	1,485.00	Demand	0	0	1,620.93	135.93	58.81
J-130	1,480.00	Demand	0	0	1,611.84	131.84	57.04
J-131	1,500.00	Demand	0	0	1,623.63	123.63	53.49

Scenario: Base
Steady State Analysis
Pipe Report

Label	Length (ft)	Diameter (in)	Material	Hazen-Williams C	Check Valve?	Control Status	Discharge (gpm)	Headloss Gradient (ft/1000ft)	Pressure Pipe Headloss (ft)	Velocity (ft/s)
P-2	203.00	12.0	PVC	150.0	false	Open	-82	0.02	0.00	0.23
P-3	518.00	12.0	PVC	150.0	false	Open	-125	0.04	0.02	0.35
P-4	367.00	12.0	PVC	150.0	false	Open	-167	0.07	0.03	0.47
P-5	341.00	12.0	PVC	150.0	false	Open	-185	0.09	0.03	0.52
P-6	760.00	12.0	PVC	150.0	false	Open	-234	0.13	0.10	0.66
P-7	604.00	12.0	PVC	150.0	false	Open	-297	0.20	0.12	0.84
P-8	544.00	12.0	PVC	150.0	false	Open	-460	0.46	0.25	1.31
P-9	837.00	12.0	PVC	150.0	false	Open	-507	0.55	0.46	1.44
P-10	1,674.00	12.0	PVC	150.0	false	Open	-621	0.81	1.35	1.76
P-11	1,571.00	12.0	PVC	150.0	false	Open	-672	0.93	1.46	1.91
P-13	224.00	12.0	PVC	150.0	false	Open	717	1.05	0.24	2.03
P-14	1,545.00	12.0	PVC	150.0	false	Open	693	0.99	1.52	1.97
P-15	2,435.00	12.0	PVC	150.0	false	Open	662	0.91	2.21	1.88
P-16	983.00	12.0	PVC	150.0	false	Open	577	0.70	0.69	1.64
P-17	931.00	12.0	PVC	150.0	false	Open	539	0.62	0.58	1.53
P-18	375.00	12.0	PVC	150.0	false	Open	521	0.58	0.22	1.48
P-19	2,492.00	12.0	PVC	150.0	false	Open	521	0.58	1.45	1.48
P-21	1,939.00	12.0	PVC	150.0	false	Open	477	0.49	0.96	1.35
P-22	4,177.00	12.0	PVC	150.0	false	Open	218	0.12	0.49	0.62
P-23	1,726.00	12.0	PVC	150.0	false	Open	161	0.07	0.11	0.46
P-24	3,667.00	12.0	PVC	150.0	false	Open	106	0.03	0.11	0.30
P-26	981.00	12.0	PVC	150.0	false	Open	62	0.01	0.01	0.18
P-27	2,131.00	12.0	PVC	150.0	false	Open	14	0.00	0.00	0.04
P-28	147.00	10.0	PVC	150.0	false	Open	74	0.04	0.01	0.30
P-29	1,365.00	10.0	PVC	150.0	false	Open	72	0.04	0.05	0.30
P-30	1,589.00	10.0	PVC	150.0	false	Open	68	0.03	0.05	0.28
P-31	1,956.00	10.0	PVC	150.0	true	Open	33	0.01	0.02	0.13
P-32	582.00	10.0	PVC	150.0	false	Open	-94	0.06	0.03	0.38
P-33	1,614.00	10.0	PVC	150.0	false	Open	3	0.00	0.00	0.01
P-34	637.00	10.0	PVC	150.0	false	Open	-63	0.03	0.02	0.26
P-35	322.00	10.0	PVC	150.0	false	Open	-67	0.03	0.01	0.27
P-36	1,209.00	10.0	PVC	150.0	false	Open	-79	0.04	0.05	0.32
P-37	823.00	10.0	PVC	150.0	false	Open	-227	0.30	0.25	0.93
P-38	639.00	10.0	PVC	150.0	false	Open	-259	0.39	0.25	1.06
P-39	477.00	8.0	PVC	150.0	false	Open	-97	0.19	0.09	0.62
P-40	690.00	8.0	PVC	150.0	false	Open	-129	0.31	0.22	0.82
P-41	378.00	8.0	PVC	150.0	false	Open	-249	1.07	0.40	1.59
P-42	887.00	8.0	PVC	150.0	false	Open	-255	1.12	0.99	1.63
P-43	401.00	8.0	PVC	150.0	false	Open	-285	1.38	0.55	1.82
P-44	1,447.00	8.0	PVC	150.0	false	Open	-315	1.65	2.39	2.01
P-45	761.00	8.0	PVC	150.0	false	Open	-615	5.69	4.33	3.92
P-46	481.00	8.0	PVC	150.0	false	Open	273	1.27	0.61	1.74
P-47	590.00	8.0	PVC	150.0	false	Open	259	1.15	0.68	1.65
P-48	1,612.00	8.0	PVC	150.0	false	Open	236	0.97	1.56	1.51
P-49	986.00	8.0	PVC	150.0	true	Open	203	0.73	0.72	1.30
P-50	1,532.00	8.0	PVC	150.0	false	Open	158	0.46	0.71	1.01
P-51	526.00	8.0	PVC	150.0	false	Open	131	0.33	0.17	0.84
P-52	400.00	8.0	PVC	150.0	false	Open	112	0.24	0.10	0.72
P-53	1,077.00	8.0	PVC	150.0	false	Open	83	0.14	0.15	0.53
P-54	506.00	8.0	PVC	150.0	false	Open	54	0.06	0.03	0.35
P-55	401.00	8.0	PVC	150.0	false	Open	32	0.02	0.01	0.21
P-56	769.00	8.0	PVC	150.0	false	Open	-3	0.00	0.00	0.02
P-57	855.00	8.0	PVC	150.0	false	Open	-22	0.01	0.01	0.14

Scenario: Base
Steady State Analysis
Pipe Report

Label	Length (ft)	Diameter (in)	Material	Hazen-Williams C	Check Valve?	Control Status	Discharge (gpm)	Headloss Gradient (ft/1000ft)	Pressure Pipe Headloss (ft)	Velocity (ft/s)
P-58	1,301.00	8.0	PVC	150.0	true	Open	64	0.09	0.11	0.41
P-59	551.00	8.0	PVC	150.0	false	Open	-98	0.19	0.10	0.62
P-60	613.00	8.0	PVC	150.0	false	Open	-121	0.28	0.17	0.77
P-61	855.00	8.0	PVC	150.0	false	Open	96	0.18	0.16	0.61
P-62	691.00	8.0	PVC	150.0	false	Open	66	0.09	0.06	0.42
P-63	1,464.00	8.0	PVC	150.0	false	Open	66	0.09	0.13	0.42
P-64	756.00	8.0	PVC	150.0	false	Open	30	0.02	0.02	0.19
P-65	1,415.00	8.0	PVC	150.0	false	Open	43	0.04	0.06	0.27
P-66	1,084.00	8.0	PVC	150.0	false	Open	42	0.04	0.04	0.27
P-67	387.00	8.0	PVC	150.0	false	Open	18	0.01	0.00	0.11
P-68	1,065.00	8.0	PVC	150.0	false	Open	49	0.05	0.06	0.31
P-69	663.00	8.0	PVC	150.0	false	Open	38	0.03	0.02	0.24
P-70	422.00	8.0	PVC	150.0	false	Open	25	0.02	0.01	0.16
P-71	356.00	8.0	PVC	150.0	false	Open	89	0.16	0.06	0.57
P-72	809.00	8.0	PVC	150.0	false	Open	68	0.10	0.08	0.43
P-73	816.00	8.0	PVC	150.0	false	Open	43	0.04	0.03	0.27
P-74	261.00	8.0	PVC	150.0	false	Open	25	0.01	0.00	0.16
P-75	488.00	8.0	PVC	150.0	false	Open	21	0.01	0.01	0.13
P-76	173.00	8.0	PVC	150.0	false	Open	1	0.00	0.00	0.01
P-77	192.00	8.0	PVC	150.0	false	Open	1	0.00	0.00	0.01
P-78	763.00	8.0	PVC	150.0	false	Open	47	0.05	0.04	0.30
P-79	1,124.00	10.0	PVC	150.0	false	Open	114	0.08	0.10	0.47
P-80	2,038.00	10.0	PVC	150.0	false	Open	45	0.02	0.03	0.18
P-81	1,039.00	8.0	PVC	150.0	false	Open	51	0.06	0.06	0.33
P-82	907.00	8.0	PVC	150.0	false	Open	86	0.15	0.14	0.55
P-83	1,344.00	8.0	PVC	150.0	false	Open	49	0.05	0.07	0.31
P-84	794.00	8.0	PVC	150.0	false	Open	22	0.01	0.01	0.14
P-85	382.00	8.0	PVC	150.0	false	Open	4	0.00	0.00	0.03
P-86	806.00	8.0	PVC	150.0	false	Open	48	0.05	0.04	0.31
P-87	998.00	8.0	PVC	150.0	false	Open	46	0.05	0.05	0.29
P-88	494.00	8.0	PVC	150.0	false	Open	101	0.20	0.10	0.64
P-89	787.00	8.0	PVC	150.0	false	Open	66	0.09	0.07	0.42
P-90	627.00	8.0	PVC	150.0	false	Open	33	0.03	0.02	0.21
P-91	847.00	8.0	PVC	150.0	false	Open	33	0.03	0.02	0.21
P-92	646.00	8.0	PVC	150.0	false	Open	35	0.03	0.02	0.22
P-93	1,297.00	8.0	PVC	150.0	false	Open	61	0.08	0.10	0.39
P-94	401.00	8.0	PVC	150.0	false	Open	5	0.00	0.00	0.03
P-95	187.00	8.0	PVC	150.0	false	Open	2	0.00	0.00	0.01
P-97	1,051.00	8.0	PVC	150.0	false	Open	56	0.07	0.07	0.36
P-98	1,138.00	8.0	PVC	150.0	false	Open	32	0.02	0.03	0.20
P-99	542.00	8.0	PVC	150.0	false	Open	23	0.01	0.01	0.15
P-100	425.00	8.0	PVC	150.0	false	Open	34	0.03	0.01	0.22
P-101	704.00	8.0	PVC	150.0	false	Open	26	0.02	0.01	0.17
P-102	599.00	8.0	PVC	150.0	false	Open	16	0.01	0.00	0.10
P-103	1,044.00	8.0	PVC	150.0	false	Open	19	0.01	0.01	0.12
P-104	806.00	8.0	PVC	150.0	false	Open	35	0.03	0.02	0.22
P-105	862.00	8.0	PVC	150.0	false	Open	22	0.01	0.01	0.14
P-106	601.00	8.0	PVC	150.0	false	Open	29	0.02	0.01	0.19
P-107	703.00	8.0	PVC	150.0	false	Open	29	0.02	0.01	0.19
P-108	660.00	8.0	PVC	150.0	false	Open	19	0.01	0.01	0.12
P-109	643.00	8.0	PVC	150.0	false	Open	27	0.02	0.01	0.17
P-110	464.00	8.0	PVC	150.0	false	Open	20	0.01	0.00	0.13
P-111	632.00	8.0	PVC	150.0	false	Open	25	0.02	0.01	0.16

Scenario: Base
Steady State Analysis
Pipe Report

Label	Length (ft)	Diameter (in)	Material	Hazen-Williams C	Check Valve?	Control Status	Discharge (gpm)	Headloss Gradient (ft/1000ft)	Pressure Pipe Headloss (ft)	Velocity (ft/s)
P-112	1,205.00	8.0	PVC	150.0	false	Open	33	0.03	0.03	0.21
P-113	557.00	8.0	PVC	150.0	false	Open	23	0.01	0.01	0.15
P-114	411.00	8.0	PVC	150.0	false	Open	14	0.01	0.00	0.09
P-115	955.00	8.0	PVC	150.0	false	Open	30	0.02	0.02	0.19
P-116	625.00	8.0	PVC	150.0	false	Open	30	0.02	0.01	0.19
P-117	436.00	8.0	PVC	150.0	false	Open	6	0.00	0.00	0.04
P-118	770.00	8.0	PVC	150.0	false	Open	66	0.09	0.07	0.42
P-119	674.00	8.0	PVC	150.0	false	Open	-55	0.07	0.04	0.35
P-120	1,059.00	8.0	PVC	150.0	false	Open	120	0.28	0.29	0.77
P-121	1,593.00	8.0	PVC	150.0	false	Open	28	0.02	0.03	0.18
P-122	582.00	8.0	PVC	150.0	false	Open	32	0.02	0.01	0.20
P-123	799.00	8.0	PVC	150.0	false	Open	57	0.07	0.06	0.36
P-124	482.00	8.0	PVC	150.0	false	Open	12	0.00	0.00	0.08
P-125	200.00	8.0	PVC	150.0	false	Open	4	0.00	0.00	0.03
P-126	530.00	8.0	PVC	150.0	false	Open	26	0.02	0.01	0.17
P-127	770.00	8.0	PVC	150.0	false	Open	24	0.01	0.01	0.15
P-128	1,615.00	8.0	PVC	150.0	false	Open	31	0.02	0.04	0.20
P-129	902.00	8.0	PVC	150.0	false	Open	49	0.05	0.05	0.31
P-130	717.00	8.0	PVC	150.0	false	Open	36	0.03	0.02	0.23
P-131	719.00	8.0	PVC	150.0	false	Open	38	0.03	0.02	0.24
P-132	534.00	8.0	PVC	150.0	false	Open	18	0.01	0.00	0.11
P-133	694.00	8.0	PVC	150.0	false	Open	24	0.01	0.01	0.15
P-134	624.00	8.0	PVC	150.0	false	Open	20	0.01	0.01	0.13
P-136	4,342.00	12.0	PVC	150.0	false	Open	-780	1.23	5.33	2.21
P-139	1,765.00	12.0	PVC	150.0	false	Open	108	0.03	0.06	0.31
P-96	264.00	8.0	PVC	150.0	false	Open	3	0.00	0.00	0.02
P-138	1,317.00	12.0	PVC	150.0	true	Open	108	0.03	0.04	0.31
P-20	1,032.00	12.0	PVC	150.0	false	Open	497	0.53	0.55	1.41
P-140	796.00	12.0	PVC	150.0	false	Open	-1,332	3.31	2.63	3.78
P-141	2,196.00	12.0	PVC	150.0	true	Open	780	1.23	2.70	2.21
P-142	177.00	12.0	PVC	150.0	false	Open	2,112	7.76	1.37	5.99

Scenario: Base
Steady State Analysis
Reservoir Report

Label	Elevation (ft)	Zone	Inflow (gpm)	Calculated Hydraulic Grade (ft)
R-1	1,625.00	Zone-1	-2,112	1,625.00

APPENDIX 3: SITE MASTER PLAN

Land Use Schedule

Use	Acreage
Residential	
Parkside	1,174.17 acres
Active Adult	1,001.46 acres
Model Center	28.60 acres
Vacation Getaways	5.88 acres
Total Residential	2,210.11 acres
Non-Residential	
18 Hole Golf Course	227.59 acres
Golf Club	5.63 acres
Active Adult Community Center	22.56 acres
Community Center	17.03 acres
Community Park	55.86 acres
Open Space	242.54 acres
Road Right Of Ways	248.54 acres
Golf Maintenance	1.96 acres
Park Maintenance	1.54 acres
Commercial	18.04 acres
Out Parcels	44.04 acres
Total Non-Residential	885.33 acres
Community Facilities	
(2) K-8 Schools	36.73 acres
Worship	30.45 acres
Fire/Police Station	3.85 acres
Total Community Facilities	71.03 acres
Total Project	3,166.47 acres

PHASE 1

SCALE: 1"=600'

JACK JOHNSON COMPANY

Designing World Destinations

In-Person - 1777 Sun Peak Drive - Park City - Utah 84098
Telephone - 435.645.9000 -- Facsimile - 435.649.1620
www.jackjohnson.com

DATE:	OCTOBER 2004
DESIGNED BY:	STAFF
DRAWN BY:	STAFF
REVIEWED BY:	
PROJECT:	742.0204.07
ISSUE:	OCTOBER 19, 2004

REVISIONS

PULTE HOMES

ANTHEM

@ MERRILL RANCH

PARCEL MAP | 1

path: Y:\742MerrillRanch\04 Design\Water\West of Felix 10-04\Master10-04\AutoCAD\
file name: ANTHEM-EXHIBIT-10-14-04.dwg | plot date: October 18, 2004 | plotted by: SPW

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ATTACHMENT 4

JOHNSON UTILITIES Aquatic Consulting & Testing Laboratory Reports for Wells

Source	Date	Nitrate Result	Date	Arsenic Result	
Oasis POE001	*9/14/2004*	1.02	*6/16/2003*	0.022	
Skyline POE001	*9/14/2004*	6.92	*8/20/2003*	0.003	
Johnson Ranch POE001	*8/11/2004*	8.83	*6/18/1997*	0.005	
Sun Valley 5 POE001	*8/24/2004*	0.57	*6/5/2004*	0.005	
Circle Cross POE001	*8/31/2004*	0.96	*11/5/2003*	0.002	
Wildhorse POE001	*9/14/2004*	8.45	*3/31/2004*	<0.005	

ATTACHMENT 5

JOHNSON UTILITIES
IDENTIFICATION NUMBERS FOR ALL DRINKING WATER SYSTEMS

	System Number
Johnson Utilities Water System	11-128
Sun Valley Water System	11-116

ATTACHMENT 6

JOHNSON UTILITIES
FACILITY NUMBERS FOR ALL WASTEWATER TREATMENT PLANTS

Id Number	Facility				
103081	*SECTION 11*				
105004	*PRECISION*				
105324	*PECAN RECLAMATION PLANT*				
105325	SANTAN RECLAMATION PLANT				